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MOTOR AGE

VOLUME XXI CHICAGO, MAY 9, 1912 NUMBER 19

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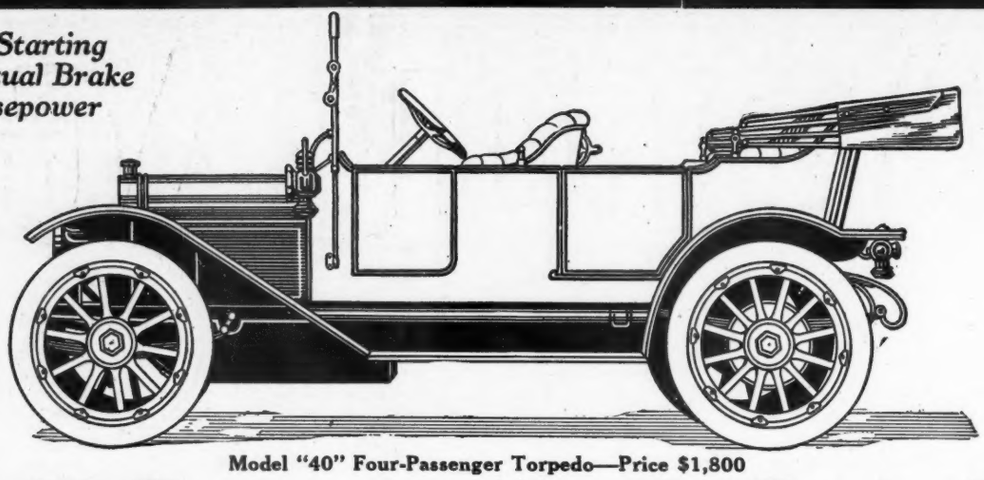

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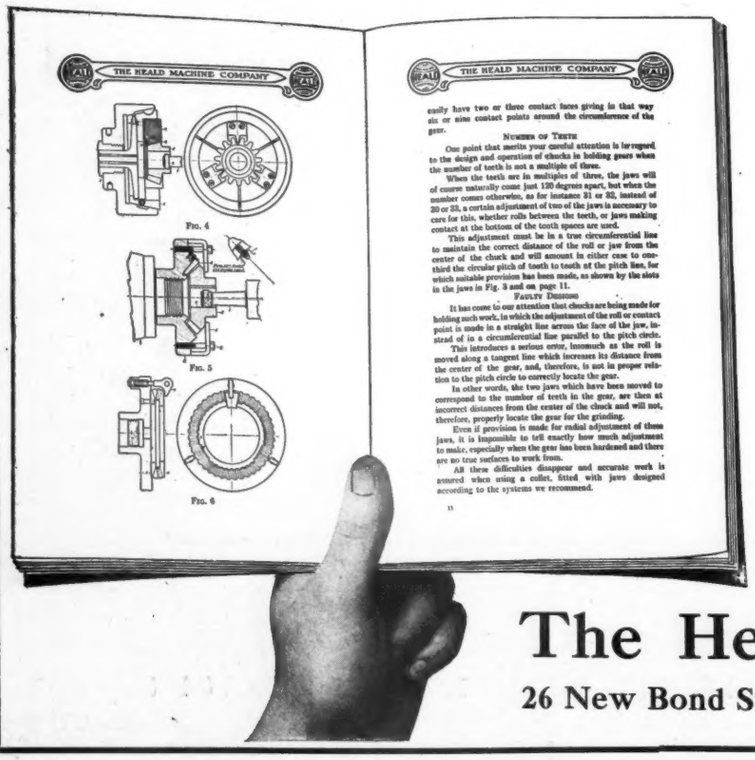

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MOTOR AGE

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Contents

DEPARTMENTS

VOL. XXI, No. 19 CHICAGO, MAY 9, 1912 $3.00 PER YEAR

MOTOR AGE

Teddy Tetzlaff Again King of the Road

Californian in Fiat Averages 78.7 Miles Per Hour for 303 Miles at Santa Monica —Mercer and Maxwell Other Winners, Each Breaking Class Record

By Fred Pabst

LOS ANGELES, Cal., May 5—Special telegram—Teddy Tetzlaff has come back into his own—once more he wears the Santa Monica laurel wreath on his brow and to his credit stands the world's record formerly held by Harvey Herrick in the National. Winner of the 1910 Santa Monica, at which time he created a new American road record of 73.22 miles an hour in a Lozier, Tetzlaff came back yesterday in the free-for-all over the Santa Monica course and raised Herrick's world's figures from 74.62 miles an hour to 78.7, a remarkable increase. Tetzlaff drove the same big 90-horsepower Fiat, with a bore of 5⅞ inches and a stroke of 8 inches, that Wagner drove in the American grand prix at Savannah last fall. The distance of yesterday's free-for-all was 303 miles, whereas Herrick went only 202 miles when he made his record, while the 1910 event in which Tetzlaff went at 73.22 miles per hour only was at a distance of 151 miles.

The free-for-all was the windup of a meet which included two other events, one a race at 151.5 miles for the 231-300 class cars, which was won by Ralph de Palma in a Mercer, with the Nikrent Case second and the Disbrow Case third, de Palma averaging 69.8 miles per hour, shattering the mark of 69.5 made in the same class last fall at Santa Monica by Keene in a Marmon. The third race was at 101 miles for the 161-230 class, the winner being a Maxwell driven by George Joerman, who defeated the two Flanders, Evans and Tower driving, at an average pace of 61.9 miles per hour for the century.

As already mentioned, this is the second victory for Tetzlaff in this Pacific coast classic. Despite the fact that many of the greatest road pilots have come to the coast for this race, for four straight years it has been won by a California driver, twice in world's record time and twice for a new American record.

Close on Tetzlaff's heels in the race yesterday was Caleb Bragg in another Fiat. This plucky easterner flashed over the line in 3:53:05 and 2 minutes 20 seconds later Bruce-Brown and his Benz rolled into third place. They were the only three to finish, although the two Stutzes were in their thirty-fourth lap when the end came. Dingley in a Pope

ROAD RACING RECORDS

Race and year—	Car	Distance	M.P.H.
Santa Monica, 1912...	Fiat	303	78.7
Santa Monica, 1911...	National...	202	74.62
Savannah grand prix, 1911	Fiat	411	74.45
Vanderbilt, 1911.....	Lozier	291	74.07
Florio, 1908.....	Fiat	328	74.3

TEDDY TETZLAFF

DE PALMA, MERCER, WINNER OF THE 231-300 CLASS

and Oldfield in a Fiat were the other starters. Neither one finished, dropping out before the final flag.

Tetzlaff won by a margin of 2 minutes 8 seconds and it was a battle every foot of the way. Brown followed so closely that any mishap would have produced a new leader, and when Brown was forced to fall back on account of tire trouble Bragg leaped into his place and gave chase until the last lap.

With the race well in his grasp, Tetzlaff became overconfident and almost tossed off the hard-earned world's honors. For thirty-five laps he had sent his Fiat around the course at a speed never before known on the road without the sign of a mishap. He had been given the green flag by Starter Fred Wagner and was sweeping down Ocean Front to the right angle Ne-

TABLE OF RESULTS IN THE 231-300 CLASS RACE AT SANTA MONICA, WON BY

Car	Driver	Bore	Stroke		1	2	3	4	5	6
Mercer	De Palma...	4⅜	5	Elapsed time	7:24	15:28	21:44	29:03	36:17	43:25
				Lap time....	7:24	6:04	7:16	7:19	7:15	7:08
Case	L. Nikrent..	4⅜	5	Elapsed time	7:31	14:51	22:11	29:34	37:58	44.14
				Lap time....	7:31	7:20	7:20	7:23	8:24	6:16
Case	Disbrow	4⅜	5	Elapsed time	7:39	15:09	27:09	35:12	42:35	50:15
				Lap time....	7:39	7:30	12:00	8:03	7:23	7:40
Warren	Miller	4⅛	4½	Elapsed time	8:58	17:35	25:53	34:07	42:15	50:16
				Lap time....	8:58	8:35	8:20	8:14	8:08	8:01
Schacht	Shain	4 1/10	5	Elapsed time	16:39	15:11	11:51	13:53	15:01	16:24
				Lap time....	16:39	31:50	43:41	57:34	1:12:33	1:28:57
Buick	Devore	4.36	5	Elapsed time	7:36	14:50	21:59	29:06	36:14	43:15
				Lap time....	7:36	7:14	7:09	7:07	7:08	7:01
Mercer	Jeffkins	4⅜	5	Elapsed time	45:32	1:10:43				
				Lap time....	45:32	25:11				
Midland	Seifert	4⅜	5	Elapsed time	Out—Magneto Trouble.					
				Lap time....						

TABLE OF RESULTS IN THE 161-230 CLASS AT SANTA MONICA, WON BY

No.	Car.	Driver.	Bore.	Stroke.		1	2	3
16	Maxwell	Joerman ...	4 9/64	4¼	Elapsed time.....	8:20	16:26	24:35
10	Flanders	Evans	4	4½	Elapsed time.....	8:36	16:57	25:14
11	Flanders	Tower	4	4½	Elapsed time.....	8:40	16:51	25:00
9	Regal	Anthony ...	3¾	4	Elapsed time.....	8:56	17:27	25:57
10	Reo	Krouse	4	4½	Elapsed time.....	14:14	25:05	34:19
13	Buick	Nikrent ...	3¾	3¾	Elapsed time.....	8:35	38:21	46:45
14	Ford	Rosher	3¾	4	Elapsed time.....	9:52	19:05	34:25
12	Ford	Charle	3¾	4	Elapsed time.....	8:47	17:06	26:33

JOERMAN IN MAXWELL, WINNER OF 161-230 CLASS

CALEB BRAGG, FIAT, WHO WAS SECOND IN FREE-FOR-ALL AT SANTA MONICA

TABLE OF RESULTS IN THE FREE-FOR-ALL AT SANTA MONICA, WON BY TEDDY TETZLAFF IN

Driver	Car	Bore	Stroke	Time	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Tetzlaff.	Fiat....	5⅞	by 8	Elapsed	6:30	12:35	18:51'	26:08	31:27	37:47	42:30	50:31	57:03	1:03:24	1:08:47	1:16:52	1:24:31	1:30:50	1:37:12	1:43:34	1:49:59
				Lap time	6:05	6:16	7:17	5:19	6:20	5:43	7:01	6:32	6:21	5:23	8:05	7:39	6:19	6:22	6:22	6:22	6:16
Bragg...	Fiat....	5⅞	by 8	Elapsed	6:42	13:04	19:31	26:04	32:39	39:20	45:00	56:13	1:02:46	1:09:07	1:15:10	1:21:34	1:26:53	1:37:20	1:43:46	1:50:15	1:56:41
				Lap time	6:22	6:27	6:33	6:35	6:41	6:40	10:13	6:33	6:21	6:03	6:24	5:19	10:27	6:26	6:29	6:29	6:26
Brown..	Benz....	6.1	by 8	Elapsed	6:21	12:28	18:49	27:44	34:10	40:58	48:28	54:07	1:00:40	1:09:24	1:14:44	1:21:07	1:27:36	1:33:54	1:41:40	1:48:04	1:54:33
				Lap time	6:01	6:21	8:55	6:26	6:48	7:30	5:39	6:33	8:44	5:20	6:23	6:29	5:18	7:46	5:24	6:29	6:29
Lewis...	Stutz....	4¾	by 5½	Elapsed	7:26	14:30	22:07	29:23	36:51	43:57	51:10	58:20	1:05:26	1:12:31	1:19:48	1:27:00	1:34:17	1:41:35	1:48:47	1:56:04	2:03:19
				Lap time	7:24	7:17	7:16	7:28	7:06	7:13	7:10	7:06	7:05	7:17	7:12	7:17	7:18	7:12	7:27	7:27	9:14
Cooper..	Stutz...	4¾	by 5½	Elapsed	7:25	14:34	21:44	28:55	36:12	43:26	50:39	57:53	1:05:20	1:12:06	1:19:28	1:26:45	1:34:30	1:40:28	1:48:08	1:55:35	2:02:54
				Lap time	7:09	7:10	7:11	7:17	7:14	7:13	7:14	7:27	6:46	7:22	6:77	7:45	5:58	7:40	7:27	7:08	7:39
Dingley.	Simplex.	5¾	by 5¾	Elapsed	6:56	13:41	20:28	27:23	33:58	40:50	47:28	55:53	1:02:39	1:09:15	1:16:06	1:25:55	1:32:52	1:39:36	1:46:19	1:53:05	1:59:35
				Lap time	6:45	6:47	6:55	6:35	6:52	6:42	8:25	6:46	6:36	6:51	9:49	5:57	6:44	6:43	6:46	6:46	6:30
Oldfield.	Fiat....	5⅞	by 8	Elapsed	6:46	13:08	19:39	26:19	33:05	39:36	46:18	52:57	1:03:01	1:08:58	1:18:35	1:41:51	2:10:52	2:17:09	2:23:21	2:29:20	2:35:27
				Lap time	6:22	6:31	6:40	6:46	6:31	6:42	6:39	10:04	5:57	8:37	3:16	29:01	6:17	6:12	5:59	6:07	6:07

Note—The timing device on this race varied 3 minutes 45 seconds; Tetzlaff's time as recorded by the machine was 3:47:12, but his actual running time seconds to each lap as recorded in the actual time sheets. It will be noted also that there are some discrepancies in the lap times

DE PALMA, MERCER, AT AVERAGE OF 69.5 MILES PER HOUR FOR 151.5 MILES

7	8	9	10	11	12	13	14	15	16	17	18	M.P.H. Ave.
50:33	57:45	1:04:48	1:11:57	1:19:11	1:26:43	1:34:21	1:41:49	1:49:07	1:56:24	2:03:26	2:10:43	69.5
7:08	7:12	7:03	7:09	7:14	7:32	7:38	7:28	7:18	7:17	7:02	7:17	
51:34	58:50	1:06:10	1:14:34	1:22:06	1:29:36	1:37:35	1:44:34	1:51:59	1:59:23	2:06:52	2:14:25	67.3
7:20	8:16	7:20	8:24	7:32	7:30	7:29	7:29	7:25	7:24	7:29	7:23	
57:14	1:05:34	1:13:13	1:20:57	1:28:42	1:36:23	1:43:58	1:51:37	1:59:15	2:06:51	2:14:29	2:22:08	63.9
6:59	8:20	7:39	7:44	7:45	7:41	7:35	7:49	7:38	7:36	7:38	7:39	
58:23	1:06:23	1:14:14	1:25:05	1:36:34	1:48:24	1:56:44						
8:07	8:00	7:51	10:51	11:29	11:50	8:20						
10:28	9:22	9:59	9:45	9:07	9:43							
1:39:25	1:48:47	1:58:38	2:08:23	2:17:30	2:27:13							

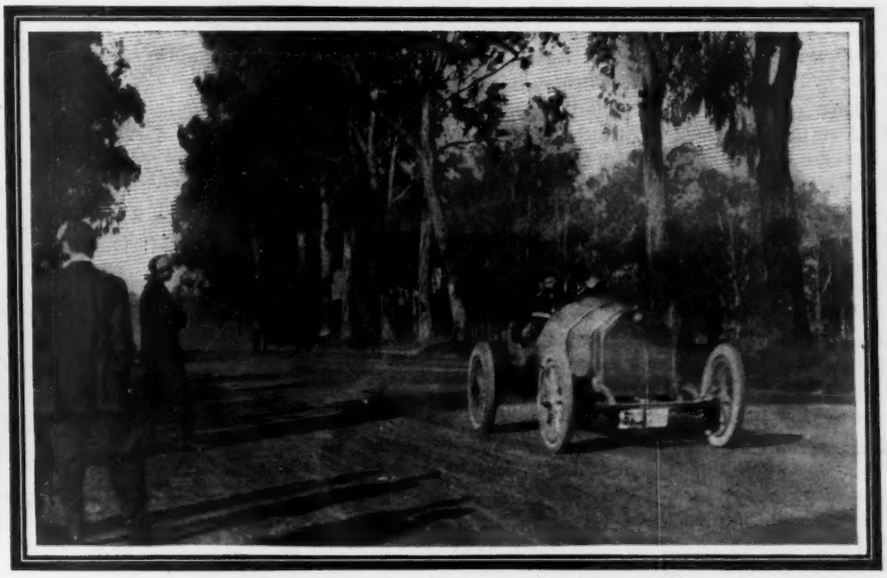
JOERMAN, MAXWELL, AT AVERAGE OF 61.9 MILES PER HOUR

4	5	6	7	8	9	10	11	12	M.P.H.
32:28	40:35	48:56	57:12	1:02:59	1:13:41	1:22:28	1:29:30	1:37:57	61.9
33:36	41:47	49:59	1:01:57	1:09:51	1:17:51	1:25:46	1:33:45	1:40:39	60.2
33:12	41:13	49:23	57:28	1:05:25	1:12:23	1:25:52	1:33:58	1:42:00	59.4
34:22	42:40	51:10	58:49	1:08:21	1:16:25	1:25:38	1:34:14	1:42:53	58.8
43:07	51:52	1:00:47	1:11:18	1:19:52	1:28:15	1:37:10	1:45:57	1:54:53	52.7
55:19	1:11:56	1:20:03	1:28:03	1:36:05	1:44:07	1:52:10	2:00:08	.....	....
1:02:30	1:11:47	1:22:34	1:32:41	1:41:48	1:51:33	2:00:19	.....	.....	....
33:39	44:41	.....	.....	.....	.....	.....	.....	.....	....

EVANS, FLANDERS, SECOND IN LITTLE-CAR RACE

DAVID BRUCE-BROWN, BENZ, WHO WAS THIRD IN FREE-FOR-ALL AT THE SANTA MONICA MEET

vada avenue turn. He failed to slow up sufficiently and came into this turn faster than at any other time. He seemed to realize his danger, but too late, and with a crash the flying leader went into the iron rail which formed a barricade at one side. There was a cloud of dust and the explosion of a tire. For a brief second the big car wavered and then steadied. Tetzlaff stopped quickly and he and his mechanic leaped out. Then was heard another roar and Bragg in the second Fiat shot around the corner. He saw Tetzlaff stopped and the people rushing from all sides. For a moment Bragg must have seen victory. But a hasty examination showed nothing more serious than a flat tire and a dent in the gasoline tank of the Tetzlaff car. Replacing the tire, Tetzlaff soon had the car on its last lap. But

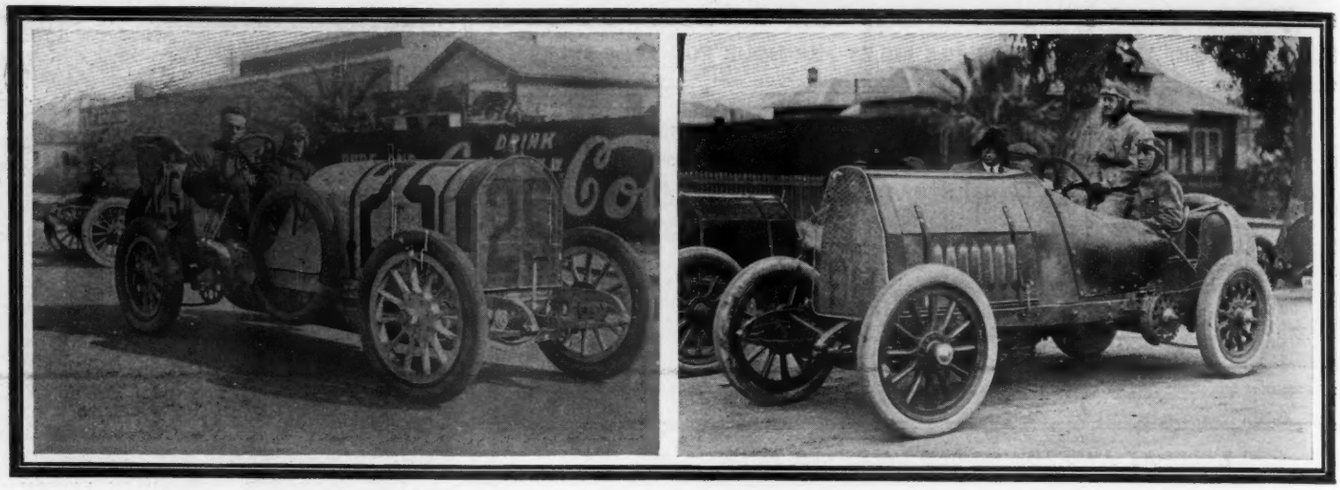


COOPER IN STUTZ, RUNNING AT FINISH

A FIAT, AT AN AVERAGE OF 78.7 MILES PER HOUR FOR 303 MILES, A NEW WORLD'S RECORD

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	M.P.H.
1:57:58	2:03:24	2:10:40	2:19:22	2:25:14	2:31:05	2:35:56	2:42:49	2:48:21	2:53:55	2:58:56	3:05:48	3:11:34	3:17:17	3:25:12	3:31:13	3:36:53	3:42:35	3:50:57	78.7
8:08	5:26	7:16	9:42	5:52	5:51	4:51	6:53	5:32	5:34	5:01	6:54	5:46	5:43	7:55	6:01	....	5:42	6:22	
2:03:07	2:10:44	2:17:26	2:23:42	2:29:32	2:35:28	2:41:11	2:48:52	2:54:37	3:00:41	3:06:36	3:12:20	3:17:58	3:23:46	3:29:25	3:38:56	3:42:29	3:48:03	3:53:05	77.9
6:26	6:37	6:42	6:16	5:50	6:56	5:43	7:41	5:45	6:04	5:55	5:44	5:38	5:48	5:39	9:31	....	....	....	
2:01:07	2:07:34	2:14:08	2:21:57	2:27:40	2:33:27	2:39:08	2:44:51	2:50:36	2:59:07	3:04:50	3:10:27	3:16:00	3:24:16	3:31:25	3:39:38	3:45:10	3:50:31	3:55:32	77.3
6:34	6:28	6:34	7:49	5:43	5:47	5:41	5:43	5:45	8:31	5:43	5:37	5:33	8:16	7:09	8:13	....	....	....	
2:10:29	2:17:47	2:24:49	2:31:30	2:38:16	2:44:57	2:53:04	2:59:50	3:06:34	3:12:74	3:19:50	3:26:43	3:33:26	3:40:01	3:46:52	3:52:53	3:58:40	....	....	
7:11	7:18	7:02	6:41	6:46	6:41	8:07	6:46	6:44	6:40	6:67	6:53	6:43	6:35	6:51	6:01	....	....	....	
2:10:33	2:21:03	2:27:50	2:34:33	2:41:13	2:47:52	2:54:36	3:01:22	3:08:10	3:14:50	3:21:31	3:28:20	3:34:50	3:41:11	3:47:34	3:53:37	3:59:52	....	....	
6:39	10:30	6:47	6:43	6:40	6:39	6:44	6:46	6:48	6:40	6:41	5:49	6:30	6:21	6:23	6:03	....	....	....	
2:06:42	2:15:30	2:19:59	2:27:21	2:35:33	2:43:50	2:55:49	3:02:07	3:08:26	3:14:40	3:22:02	3:28:46	3:35:49	3:41:08	3:47:10	....	....	....	....	
6:47	6:58	6:20	7:22	8:12	8:17	11:59	6:18	6:19	6:14	7:22	6:44	7:03	5:14	6:07	....	....	....	....	
2:41:34	2:57:14	3:03:46	3:09:54	3:15:58	3:22:35	3:29:09	3:35:46	3:50:41	....	....	....	....	....	....	....	....	....	....	
6:07	5:40	6:32	6:08	6:04	6:37	6:34	6:37	....	....	....	....	....	....	....	....	....	....	....	

was 3:50:57. Motor Age has used the latter figure as the total running time and has adjusted the times of all the contestants by adding an average of 6



BRUCE-BROWN'S BENZ AND BRAGG'S FIAT IN SANTA MONICA ROAD RACES

he had lost 2 valuable minutes, and when 6 minutes had elapsed the cry went up in the stand, "Where's Tetzlaff?" Every eye was on the palisades turn and when, after a 2-minutes' wait, the people at the turn were seen to wave their hats the grand stand let out a mighty cheer, for all knew then that the California boy was safe and bringing his car home to victory.

Bruce-Brown Makes Fastest Lap

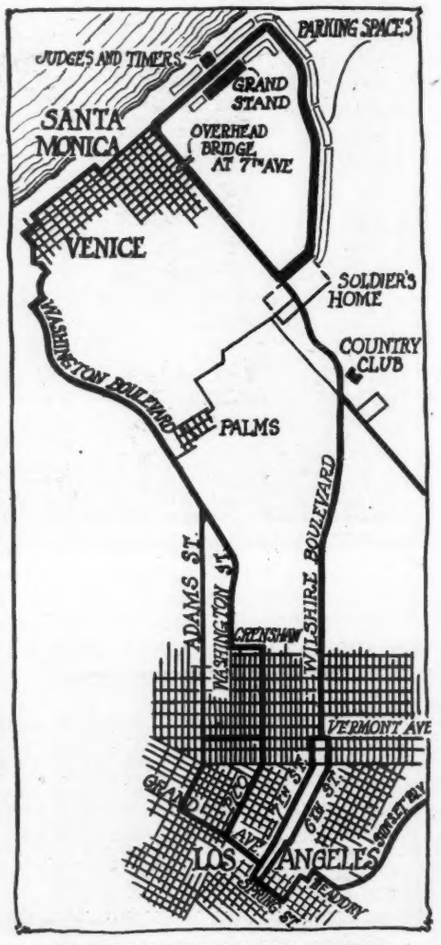
To bring in his car a winner with such a remarkable time required the making of many laps at an average speed of 85 miles an hour. The honors for the fastest lap went to Bruce-Brown, who was driving his Benz to the limit to cut down the lead of the Fiat. According to official timing, Brown covered the thirtieth lap in 5:27, but on account of a variation of the clock the correct time for this lap is about 5:32.

Tetzlaff's fast laps were in the last half of the race. During the first twenty-one laps he did not make a lap under 6 minutes, but after that he cut under that mark almost every round. He was forced to increase his speed on account of the time being made by Brown and Bragg. The winner had phenomenal tire luck. While the others were stopping for new casings he was tearing off lap after lap, and it was not until the twelfth lap that he stopped for a change. By this time he had secured a lead of 3 minutes over Brown and 4 minutes over Bragg. A slow change cut the lap to 8:08, but Bragg was forced to stop in the fourteenth and Brown in the fifteenth.

Benz an Early Leader

Brown was the early leader. He cut off the first lap in 6:15. Tetzlaff's first round was made in 6:24. The third lap found Brown leading only 2 seconds, and when he stopped in the fourth to renew two tires Tetzlaff took the lead and from there on never was headed. Caleb Bragg was running second, but by making lap after lap at an average of 6:15 Tetzlaff increased his lead until to the end of the tenth lap he was 5 minutes 34 seconds ahead of Oldfield, who by consistent going had climbed into second place with the Fiat. Bragg lost valuable minutes in the eighth lap on account of tires. He stopped at the pit again in the fourteenth to change tires and take on gas.

Oldfield was driving his race just as he had planned and was in a contending position when he came to grief in the twelfth lap. A spring bolt broke. This interfered with the steering and he drew up to the pit. This gave him further trouble on the next lap and the loss of over 30 minutes put him completely out of the running. Barney's tires were in good shape and he threatened to be dangerous when trouble came. Dingley in the Simplex had been making some fast laps, but repeated tire changes soon put him far behind. The Stutz cars ran consistently throughout the race and for lap after lap were not separated by over 25 feet. The Lewis Stutz averaged 71.4 miles per hour for 285.6 miles, while its mate did 71.3 miles per hour for the same distance.



MAP OF SANTA MONICA COURSE

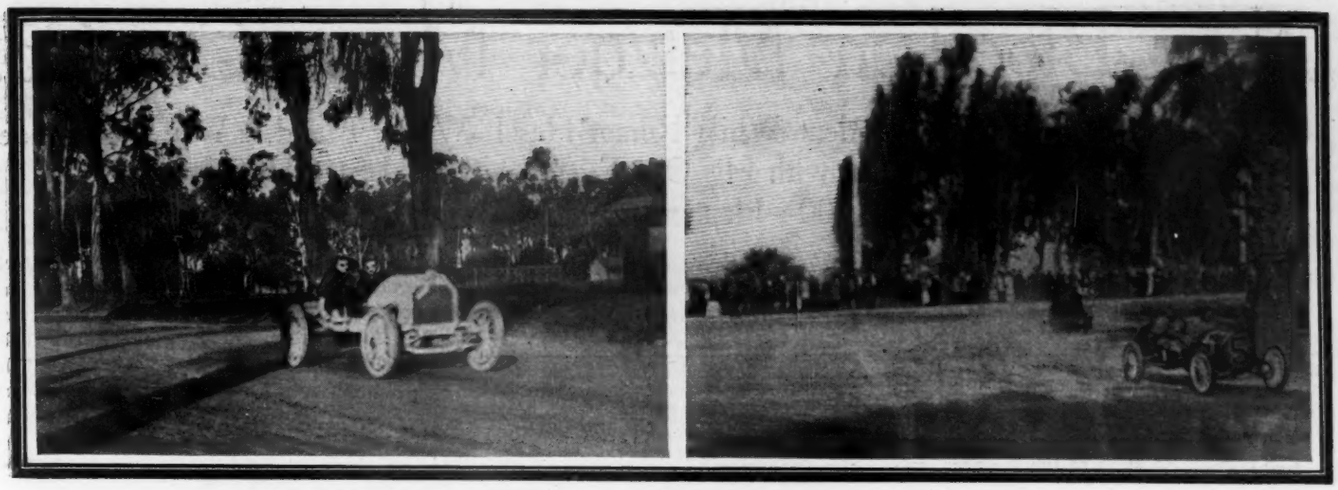
At the end of the fifteenth lap, with 126 miles covered, Tetzlaff was leading Brown by 4 minutes 18 seconds. Bragg had dropped back and was running 2 minutes behind Brown.

Tetzlaff's next stop was in the eighteenth lap, when he took on oil and gasoline and changed two rear tires which showed wear. This loss of a minute and a half did not lose the lead for the Californian and at the end of twenty laps he led Brown by 3 minutes 28 seconds. The big chance for the Benz came in the twenty-fifth lap, when Tetzlaff stopped to change a tire, requiring 8 minutes 35 seconds for the lap. Brown swept by like a cyclone while the change was being made, but in the same lap changed a tire himself and lost the time which would have put him on the heels of the leader. As it was, the finish of the twenty-fifth lap found him only 2 minutes 3 seconds behind Tetzlaff.

Tetzlaff Quickens Pace

By this time Tetzlaff realized his danger from the fast-coming Brown and began to increase his speed. His pace became faster and the two Fiats and the Benz were turning laps at 85 miles an hour. The twenty-seventh was a bad lap for Brown, who stopped for tires and fuel. This gave Tetzlaff another advantage and Bragg, who had been coming up, was only a minute behind the Benz. Tetzlaff's fast pace had given him a lead of one whole lap, but a cry of alarm went up when he stopped at the finish of the thirty-first to take on tires and fuel.

A few seconds later Brown also came to a stop for tires, and thus another chance was lost to make up the lost advantage. From there on Bragg became the con-



LOUIS NIKRENT IN BUICK AND EARL COOPER IN STUTZ IN SANTA MONICA RACES

tender, and between the thirty-second and thirty-sixth laps he cut down the lead from 4 minutes 13 seconds to half of that.

Ralph de Palma and his speedy Mercer won the medium-class in record time. He averaged 69.8 miles per hour for the 151 miles and had the race well in hand almost from the start. The Case cars driven by Nikrent and Disbrow made a very creditable showing. They were the contenders and gave a consistent performance.

Maxwell Wins Little Race

The light race went to George Joerman, a Los Angeles young man, who had bought the Maxwell racer for his personal use. Towers in the Flanders came to the front in the ninth lap, but a broken oil pipe set him back. The Flanders were second and third.

The crowd was immense. It was estimated at 150,000. The 8.4-mile course was surrounded by a mass of people many rows deep. Thousands of motor cars were driven to the beach and the stands were filled.

The course was perfectly guarded and the race well managed. The only disappointment was to the management when the Santa Monica officials broke their contracts and refused to permit the promoters to charge people for going across the bridge over the course.

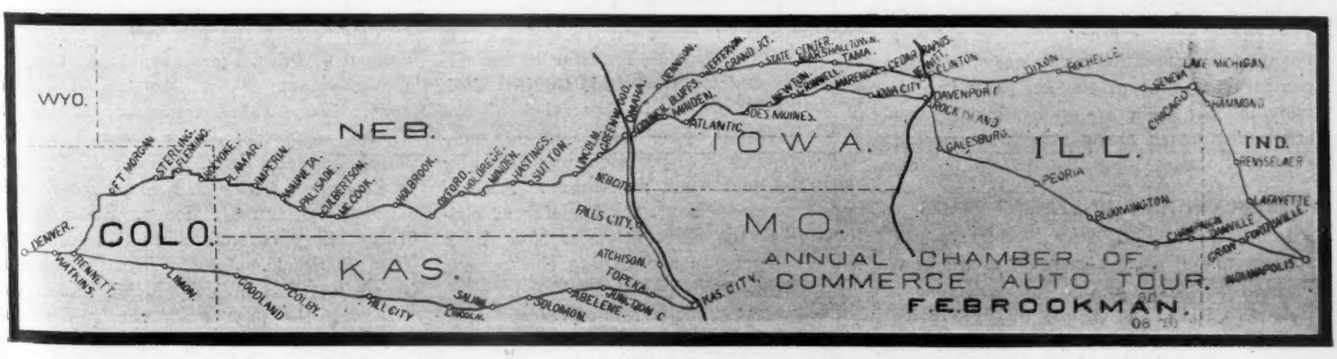
In the way of equipment Tetzlaff had Michelin tires on the front wheels of his Fiat and Millers on the rear. In the 231-300 class race the cars of de Palma, Nikrent and Disbrow were fitted with Rayfield carbureters. Tetzlaff and de Palma also used Bosch magnetos.

DENVER SHORTENS TOUR

Denver, Colo., May 6—The Denver Chamber of Commerce has abandoned its project for a Denver-New York sociability run and has made the destination Indianapolis and Chicago. This action was taken because the managers felt that a shorter tour through the middle west would mean more to the good roads and tourist movements of Colorado and the west than a long trip to the eastern seaboard, which would allow only a short stop to be made in each town. Great interest is being taken in the tour by the local motorists, and it is probable that there will be at least twenty entries. Henry B. Joy, president of the Packard company, has signified his intention of coming to Denver within the next few weeks in order to join the party when it leaves for the east on May 21. The run will be both sociability and reliability in its nature, with the sociability element predominating, for the object of the enterprise is to make the eastern people familiar with the beauties of Colorado and to help the movement for a transcontinental highway through central Colorado. The controls all have been selected and the scoring will be done only on the basis of the drivers' adherence to the schedule. The Denver Chamber of Commerce has offered a loving cup for the winning car. It is the hope of the directors of the chamber to make the run an annual event. The tour will end June 9.

The route laid out avoids Chicago on the journey to Indianapolis, but on the return trip a stop will be made in the Windy City for a couple of days.

DENVER TROPHY



ROUTE COLORADOANS WILL FOLLOW IN DENVER-INDIANAPOLIS SOCIABILITY

New Blood in Metzger Motor Car Co.

Paul Smith Becomes Vice-President, While Rumor Has It Walter Flanders Will Quit Studebaker to Cast His Lot with His Old Friends—Capital Stock Increased to $3,000,000—Henderson Announcement Made

DETROIT, Mich., May 6—Rumor has it that Walter E. Flanders has switched his allegiance from the Studebaker Corporation to the Metzger Motor Car Co. It also is said the Studebakers have accepted Mr. Flanders' resignation as general manager, that he has sold all of his Studebaker stock, and that his new title is to be general manager of the Metzger company.

This, however, is not the only surprising bit of gossip in connection with the Metzger company, for there has been a general reorganization which has brought in new capital and has brought about changes in the personnel of the company. The first the public knew of this was when the announcement was made that Paul Smith, sales manager of the motor car department of the Studebaker Corporation, had been secured for the position of vice-president and director of sales of the Metzger company, and that along with him came new capital, which is said to include Carl Fisher, of Indianapolis, and Colonel Kramer, of Mudlavia Springs. In addition to this Mr. Flanders is reputed to be a big holder of stock in the Metzger company.

This infusion of new blood, of course, brought about other changes. Harry Bill, who has been general manager, hereafter will be factory manager, while Wallace Hood will retain the title of sales manager. W. E. Metzger, who has been secretary-treasurer, will remain secretary, but another will be appointed treasurer, someone who is not financially interested in the company and who has not been selected as yet. It also has been decided to increase the directorate from five to seven.

Following a meeting of the new and old interests today, it was announced that the capital stock of the company has been increased from $1,000,000 to $3,000,000, all of which has been subscribed, $2,250,000 being common and $750,000 preferred.

The Metzger company also has decided to have two plants, one to be devoted solely to the manufacture of six-cylinder cars and the other to four-cylinders. It has been settled that the six factory will be the present plant of the company in Detroit, but the other will be located in some other city which has not been announced as yet.

HENDERSON ANNOUNCEMENT MADE

Indianapolis, Ind., May 7—The formal announcement of the formation of the new Henderson Motor Car Co. was made today. It is stated that the factory either will be in Indianapolis or so close as to permit of the executive offices being located here. L. Carter of Jessup, Ga., is president; R. P. Henderson, vice-president; L. S. French, secretary and advertising director; C. K. Share, treasurer; L. Carter, C. P. Henderson, Chester Ricker and E. E. Rogers, directors. Department heads chosen are: Chief engineer, C. S. Ricker; factory manager, Charles A. Trask; sales manager, F. E. Wilson. C. P. Henderson, at the head of the Henderson Motor Sales Co., will not be active in the new concern but will give his entire time to the general direction of sales with the Cole Motor Car Co.

MORE MARION DETAILS

Indianapolis, Ind., May 7 — The newly formed Marion Motor Car Co. will have a capitalization of $1,125,000, an increase from $100,000. The issues will be divided into $650,000 common and $500,000 preferred. Arrangements are being made for another large plant in addition to the equipment now possessed by the company at Indianapolis. Production will be much increased and the scope of the factory will be enlarged. The personnel of the executive and administrative staffs will probably be announced within 2 weeks. John I. Handley, president, has been recruiting for several weeks past. There will be no official connection between the Overland, Marion and American.

KELLY-RACINE CHANGES

Racine, Wis., May 4—There has been an extensive reorganization of the Kelly-Racine Rubber Co. and a revamping of the personnel of the officers. C. F. U. Kelly has retired as president and general manager, his place being taken by George B. Wilson. Factory Manager William Seward also is out and L. T. Vance now holds the title. Stuart Webster has been chosen as secretary and treasurer. A vice-president is yet to be selected. Mr. Vance comes from the Batavia Rubber Works of Batavia, N. Y. There has been an increase of $150,000 in the working capital, made possible by the sale of preferred stock to the company's own stockholders.

GOODRICH CITIZENSHIP TRANSFERRED

New York, May 4—Transfer of its corporate citizenship from Ohio to New York is indicated in the incorporation of the B. F. Goodrich Co. of New York for $45,000,000. The incorporation was formally chartered last week at Albany. According to announcement, the transfer of citizenship of the corporation to New York will not result in abandoning the present administrative equipment at Akron.

The official headquarters of the company will be located in New York city, where a suite of rooms will be provided for the regular and special meetings of the directors under the law. The annual meeting will be called within 2 weeks, when several new members of the board will be selected. The Ohio corporation will take rank as a subsidiary of the New York company by reason of stock ownership by the holding company.

CADILLAC GETS LONG PLANT

Detroit, Mich., May 7—The Long Mfg. Co. has sold its plant on Cass avenue to the Cadillac Motor Car Co. The property has a frontage of 320 feet and is 145 feet deep. The factory, a new two-story structure, occupies about two-thirds of the land, and will be used by the Cadillac company for extensions of manufacture. The Long company has bought a new factory site, 270 by 120 feet in size, and will begin at once the erection of a new plant containing double the floor space of its present quarters. It is intended largely to increase the output of radiators. The two deals involve an aggregate investment of $250,000 in new buildings and plant extensions.

TO MAKE WHEEL HUBS

Jackson, Mich., May 6—Jackson capital will establish a branch factory at Albion, Mich., for the manufacture of motor wheel hubs. The factory will be operated in connection with the Albion Malleable Iron Works and the Hayes Wheel Co. of Jackson. At present the Hayes Wheel Co. is not making its own hubs, buying them, instead, from jobbers. With the establishment of the branch at Albion the hubs will be made under the supervision of superintendents from the Jackson factory. Stanley Porter of this city will have charge of the Albion branch which will be located in the old Prouty plant.

BUFFALO ELECTRIC BOARD ELECTED

Buffalo, N. Y., May 6—The Buffalo Electric Vehicle Co., the million-dollar organization which was recently incorporated here, elected directors at a special meeting held last Friday afternoon. The board of directors of the new industry follows: Samuel J. Dark, president; A. A. Landon, vice-president; W. A. Morgan, vice-president; Harry Yates, treasurer; Alfred W. Thotm, secretary; Jacob Amos, Frank L. Bapst, Laurens Enos, Howard A. Forman, O. E. Foster, Henry D. Knox, Frederick F. Klinck, William H. Kinch, Moses Shire, Harry Thorp Vars, John W. Van Allen and John T. Steele. John W. Van Allen has been selected as the corporation's attorney.

During the past week the new motor concern began the sale of $50,000 7 per cent cumulative, convertible, preferred

stock, this amount being the preferred stock which remained unsold until the opening of the public subscription. The stock is being sold at $100 per share and accrued dividend, with 25 per cent bonus of common stock in trustees' certificates. In buying subscriptions, 40 per cent is required in cash and the balance in 20 per cent installments. John T. Steele, broker, has charge of the public subscription sale.

ENGINE COMPANY MOVING

Chicago, May 4—The Continental Engine Co., of Chicago, has decided to move its plant for the manufacture of motors to Dallas City, Ill., which is located across the river from Burlington, Ia., where the shipping facilities are declared to be excellent. There will be a reorganization which will associate with John E. Peffer, manager of the company, Charles Barry, formerly mechanical engineer of the Deering Harvester Co., and T. H. Mars, late sales manager of the Model Gas Engine Works. The new plant will open this week.

NEW PLANT AT WINDSOR

Detroit, Mich., May 6—Within the next week or so ground will be broken for a large plant to be built near Windsor, Ont., by the National Auto Body Co., Ltd., recently incorporated in Canada with a capital stock of $150,000. Plans have been prepared and bids are now being received. The main building will be two stories high, of brick, 55 by 300 feet. The company will begin operations with about 100 men, manufacturing wood, steel and aluminum bodies.

The Hupp Motor Car Co.'s new plant at Milwaukee and Mt. Elliott avenues has just received the finishing touches and the company is now thoroughly settled in the new location. The company now has more than triple the capacity the old plant on Jefferson avenue afforded, with ½ mile of railroad track.

PUSHING OMAHA PRODUCTION

Omaha, Neb., May 6—President D. W. Henry of the Omaha Motor Car Co., reports that the factory has turned out five cars of the first lot of 100 and that it is expected deliveries will start within the next week. He asserts the company has secured orders for from 250 to 300 pleasure cars and that within a short time it will start building trucks of a capacity of about 1½ ton. Within a couple of weeks the company will break ground for its new plant which is to be a two-story building 100 feet wide by 400 feet deep. The power house and foundry will be separate.

NEW CHICAGO ORGANIZATION

Chicago, May 7—A Chicago section of the Electric Vehicle Association of America was organized in this city last night for the purpose of furthering the interests of pleasure and commercial electric vehicles locally. In honor of the occasion a dinner was given by the Commonwealth Edison Co. at which seventy-five of the representatives of the electric interests in Chicago attended. After the dinner a constitution for the new Chicago section was adopted and officers as follows elected: Chairman, George H. Jones; vice-chairman, G. H. Atkin; secretary, J. W. McDowell, and an executive committee of C. C. Murphy and L. E. Burr, to act with the other officers. W. H. Blood, Jr., president of the Electric Vehicle Association, gave an address on the "Necessity of Coöperation Among the Electric Vehicle Manufacturers" and also outlined the work that this organization is doing in New York and Boston. It has at present a membership of 270.

PARRISH SELECTS DETROIT

Detroit, Mich., May 6—The Parrish Mfg. Co., of Reading, Pa., manufacturer of car frames, has decided to erect a large plant in Detroit. Charles M. Hall, the company's local representative, has secured a site on the outer belt line railway and plans for the factory are understood to be under way. It will be one of the largest frame-building plants in the country, giving employment to more than 1,000 men. It will be completely equipped. The slabs will be rolled here and every other process in the manufacture of frames will be carried out in this plant, from which the makers in Detroit, Cleveland, Buffalo and other centers in this territory will be supplied. Among the companies now supplied by the Parrish concern are the makers of the Packard and Lozier cars in Detroit; the White cars in Cleveland, and the Pierce cars in Buffalo. The Reading plant will continue in operation, supplying eastern factories.

BELVIDERE COMPANY EXPANDING

Belvidere, Ill., May 7—The Belvidere Screw and Machine Co. has voted to increase its capital from $100,000 to $200,000. The new stock was promptly subscribed and contracts have been let to more than double the present factory buildings. The factory is now running night and day shifts on motor car work and spark plug contracts. Nearly 1,000,000 spark plugs will be made this year, it is declared.

TO REORGANIZE THE VAN-L

Grand Rapids, Mich., May 6—Backed by the recommendation of the Grand Rapids Association of Commerce, the Central West Improvement Association has put the stamp of approval on the proposed reorganization of the Van-L Commercial Car Co. At present the assets of the company are about $10,892 and the liabilities are about $11,918. Articles of incorporation under the plan of reorganization have been filed and the new company, which will be known as the Commercial Service Truck Co., has been capitalized at $170,000, of which $100,000 is common and $70,000 preferred stock.

It is proposed under the reorganization plan to sell $17,000 worth of stock in $500 blocks. The outstanding debt and first expense of starting will be $6,000, leaving $11,000. In addition there are nine cars in the factory nearly completed. When finished these can be sold for $12,000, which amount will be added to the treasury.

CARLSON PATENT UPHELD

New York, May 7—Confirming the opinion of the lower court, the United States circuit court of appeals has handed down a decision upholding the Carlson patent 797,555 describing a removable cover plate for a motor car engine in which the valve-actuating mechanisms are built integral with the plate. The suit was entitled the Carlson Motor and Truck Co. against the Maxwell-Briscoe Motor Co. The defendant formerly used a device similar to the one covered by the Carlson patent, but, according to Edmonds & Edmonds, attorneys, it was altered some time ago and is not in use at present. The decree awards injunction, according and damages.

SAGER PATENT SUSTAINED

New York, May 8—Special telegram—The Sager patent 885,181 covering a horizontal buffer rod pivoted to the frame of the car was sustained by the United States district court in the suit brought by J. H. Sager & Co. against Emil Grossman. The actual defendant in the case was the United States Bumper Co., of Chicago, which manufactures under the McGregor patent.

WILL MAKE VIXEN ROTARY

Indianapolis, Ind., May 4—The Vixen Motor Co. has been recently incorporated in Indianapolis to develop and control the rights of the Vixen rotary valve motor, designed and built by Charles M. Mayers and Edgar C. Haupt. The officers of the company are Fred C. Schmid, president; William J. Harris, vice-president; and C. O. VanHorn, secretary and treasurer. Others interested in the company besides the designers are J. F. Morrison, D. R. Lindley, S. B. Lindley and Ralph J. Teetor.

The initial engine, which has been in operation for some time, has recently been given a road trial in a Cole owned by Mr. Morrison. Its performance has been so satisfactory that no changes will be made in other engines contemplated further than in dimensions and refinement of design.

HINKLEY CHALMERS ENGINEER

Detroit, Mich., May 7—C. C. Hinkley has been appointed chief engineer for the Chalmers Motor Co. and assumed his new duties May 1. Mr. Hinkley was formerly an associate of George W. Dunham, vice-president and consulting engineer of the Chalmers company.

THOMPSON REPLACES BRADEN

Akron, O., May 7—Clyde S. Thompson has succeeded James A. Braden as advertising manager of the Diamond Rubber Co., the latter resigning because of poor health.

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Developing Exports

HISTORY repeats itself! There is nothing new under the sun! What are defined as the changes of today are but modifications of yesterday. What are designated by some as revolutionizing methods of the motor industry are but the recognized forces at work in the evolution of a score of other industries. The time was, not long ago, when motor car sales managers declared they wanted a different type of salesman to dispose of their product than was used in older and more matured industries. Today these same sales managers, where they have had the good fortune to continue, are searching for salesmen, salesmen from other fields, salesmen who are not different from those employed in allied industries, or such older industries as the electrical field and large industrial fields. The developments of 5 short years have demonstrated to the satisfaction of all that when it comes to real salesmanship, the forces and factors that sell mercantile products, that sell electrical products and that sell realty can sell motor cars just as well.

SALESMANSHIP is salesmanship! Selling merchandise, whether in the form of motor cars, silk gloves, municipal bonds or farm lands, calls for an exercise of the same principles of presentation. Each has its local coloring, but down at bed rock the modus operandi is the same. Each calls for a study of humanity, a study of the product and a study of conditions. These understood, the methods of attack, the mode of presentation, and the marshalling of arguments are alike. The motor car sales manager has come to a realization of this. It has been imperative that he should—you cannot make progress when proceeding contrary in the channels that public usage has worn.

WHAT is true in salesmanship is true in the export field! A few years ago not a few of our makers were going to stampede the European market. Their policy was to cast tradition to the four winds. They were proceeding on new policies; in a word, they were going to revolutionize the old world. To them the customs of doing business, founded upon centuries of habit, were to be uprooted in a few months. Pages in the press, with whirlwind demonstrations, were looked upon as the all-conquering forces. The assault failed—failed utterly. The attacking forces fell back discomfited; in some cases they withdrew in hopeless defeat, not with sufficient strength to make a re-attack.

ALL were not so! In the American motor car field there are some real merchants—men of business who have studied industries, studied exportation and studied manufacture. How different was their attack! They studied the enemy, they studied how his ramparts had been scaled by the merchants of other lands, they studied how his breastworks had been stormed, and they concluded that what the other merchant had done they could do, if study and work were combined. They attempted nothing new, merely local modifications of time-established principles of developing export business. If Paris were the objective point they established themselves in a permanent location—no fly-by-night habitation would suffice. They rented the best corners on the best avenues. They showed the Frenchman that they had come to stay; created in his mind the impression that although strangers from across the seas they had within them the same principles of integrity and fixity in business as those local concerns with which they and their forefathers had been doing business. Year after year they maintained their places of business, carried their stocks of merchandise, looked after every customer they picked up, established a just reputation for their goods and worked their way into the hearts of the people. They succeeded.

SUCH were our export missionaries! All credit to them, they are deserving of all and more than they are getting! They established in those foreign centers a respect for American products. They blazed the trails for the scores of later concerns that have established themselves abroad and which have played the role of parasites, reaping where others have sown and not wanting to even leave a savory name behind.

BUT attention is now centering on South America! It is the new field to be conquered; here the victories of the next 10 years must be made if America is to have her share of the enormous sales that the southern half of this hemisphere will furnish a market for. Some of our makers, with European experience, are proceeding in the right way in this new field, others are not. Some hope by a few letters and entire pages of advertising in the daily press to introduce their goods. Up to the present they are failing in such campaigns and conditions augur for a continuation of such failure. The citizen of South America is not different from the citizen of Europe. He speaks a common language with the different nations in the old world, he has carried on business transactions with them for centuries and many of his children have been educated in the schools of Europe. With such a training, with such an early experience, how can he be radically different? He is not. The motor car maker who would win success in his South American export trade must spend money, must send his personal accredited representative there and must do business as they do business there. This is imperative. After years of enterprise, when he has gained the confidences of the South American citizen, then and only then, will it be possible to change his methods, and then only will he be able to introduce his American methods of selling. Confidences must first be established, and these can only be established by talking with these people in their own languages, eating with them in their own clubs and living with them in their own cities.

SOME of the South American export business has not been creditable to the American car industry. There are not a few cases on record of American cars being sold at more than double the price they are sold in this country. This is not necessary. Already bad results are coming from such selling methods. It is expected that high prices will have to prevail there. They should. The local trade should pay for a part at least of the selling cost connected with developing a business there. But that is not a just reason for extortion. That is not a just reason for shipping old goods into a new market. That is not a just reason for selling without establishing repair depots.

THE export business is a serious business. It is too profitable a business to be trifled with. Our governing motoring organizations would do well to tear a leaf from the methods of older industries, where they all combine and establish a common bureau representing their wares. Such bureaus have many centers of location. They stand for permanency, their very existence suggests good intentions. They are worthy of imitation.

Ford Perfect in Algerian Reliability

American Car Does Well in Foreign Competition—U. S. Well Represented

PARIS, April 27—American cars figured prominently in the first official touring competition held by the Automobile Club of Algeria, when a standard Ford was classed on the clean score list with a 12-horsepower Panhard, a 12-horsepower Berliet, and a 12-horsepower Rolland-Pilain. Others to finish the run with a loss of a certain number of points were Paul Rivierre in a Reo, De Malglaive in an E-M-F, Sagnier in a Cottin-Desgouttes, Chikiken in a Cottin-Desgouttes, Poujet in a Cottin-Desgouttes, and Romano in an E-M-F. Three French cars, a Luc Court, Rolland-Pilain and Bayard-Clement, failed to cover the distance.

The event, which was the first of its kind held in the French colony of Algeria, was a 3-day, 500-mile reliability test, with a minimum average of 19 miles an hour. Except for filling the gasoline, oil and water tanks before the start of each day's run, no work whatever could be done on the cars, and even the lifting of the bonnet during the run was penalized. There was no loss of marks for punctures, unless the outer casing had to be changed, but new tubes had to be put in within a time limit of 30 minutes, 1 point per minute being the penalization for exceeding this time.

The failure of the gasoline or oil supply was penalized 5 points; changing or cleaning of a plug, 2 points; attaching an ignition wire, 1 point; replacing fan belt, 2 points; tightening up nuts, 1 point per nut; changing the carbureter float, 5 points; stalling the motor, 3 points; regulating brakes, 3 points; regulating clutch, 5 points; tickling carbureter, 1 point; all other repairs, 10 points.

WRANGLING WITH NEW JERSEY

Philadelphia, Pa., May 4—The question of the recognition of Pennsylvania manufacturers' license numbers by the authorities of New Jersey, and vice versa, has during the past week been one of no little concern to the motorists of the two states. Indeed, so much hostility developed that threats and counter threats of arrest of motorists carrying only manufacturers' tags were hurled back and forth. The disagreement between the authorities came about through different interpretations of the reciprocity laws. It was claimed by the local police department that Philadelphia dealers had been held up in Camden when carrying only a manufacturer's tag. On the other hand, J. B. R. Smith, commissioner of motor vehicles in New Jersey, denied the charges and threatened unless they were substantiated to retaliate by forbidding Pennsylvania motorists entrance to New Jersey in all cases where only the manufacturer's tag was used. Through the efforts of local motoring organizations a truce has been declared, and unless further complications ensue the misunderstanding will be forgotten and dealers' tags accorded official recognition on both sides of the Delaware river.

MOTORISTS LOSE CASE

Indianapolis, Ind., May 6—Members of the Hoosier Motor Club, who brought suit attacking the city motor license ordinance, have lost their fight in the county circuit court, but may appeal the case to the Indiana supreme court. In the meantime the city is insisting that motor car and motor cycle owners pay the license fee for 1912.

The suit brought was to enjoin the city from enforcing the ordinance, on the ground that it was in effect double taxation, because the machines must be registered with the state and listed for taxation. Judge Charles Remster sustained the city's demurrer in the case, holding that the state legislature had a right to provide special taxation and had specifically delegated the right to the city to levy a motor license. There are about 2,900 motor car owners in the city affected by the decision. The license fees range from $5 to $15 a year.

PENN SPEED TRAPS WORKING

Philadelphia, Pa., May 4—Philadelphia motorists who are in the habit of making Sunday trips to Atlantic City have run against a snag in the vicinity of Paulsboro, N. J. A week ago it is claimed that no fewer than 100 motorists were stopped along the main thoroughfare in the town and twelve drivers of cars and three motor cyclists arrested. These either were fined or were forced to enter bail for hearings. Warning has been issued that the crusade will continue in force for several weeks. Strict observance of speed and traffic laws will be enforced. Similar warnings have come from Haddon Heights.

The Automobile Club of Philadelphia has been particularly active in looking out for speed traps and as a consequence announcement has been made by the club that township authorities are on the job in Radnor township, Ogontz, Springfield township or Chestnut Hill, and Island road, Chester pike and Parker avenue, Delaware county.

DALLAS AFTER SPEEDWAY

Dallas, Texas, May 4—That north Texas is to soon have a great speedway to the gulf of any southern state is now the general belief of those Texans in a position to know of prevalent conditions. Today a first-class speedway is maintained from Dallas, to the gulf, little more than 300 miles, with the exception of 48 miles. That stretch of road which is unpaved lies in the central portion of the state, and bonds have already been voted to pay for the paving of the road.

Efforts are also being made to build a beach speedway from Port O'Connor to Galveston, Texas, a little more than 200 miles. This speedway is declared to be equal to any in the United States and when completed can be extended more than 300 miles.

CLUB ELECTION AT ST. LOUIS

St. Louis, Mo., May 4—The annual election of the Automobile Club of St. Louis resulted in the following officers being elected without opposition: James Hagerman, Jr., president; George J. Tansey, vice-president; E. M. Flesh, secretary.

Coming Motor Events

May 11—Hill-climb; Atlanta, Ga.
May 12—Track meet; Salt Lake City, Utah.
May 18—Sociability run at Washington, D. C.
May 17-18—Track meet; Colorado State Automobile Association; Denver, Colo.
May 21—Sociability tour Denver to Indianapolis and return; Chamber of Commerce.
*May 30—Indianapolis speedway, 500-mile race; Indianapolis, Ind.
*May 30—Track meet, Rockingham park; Salem, N. H.
May 30—Track meet, Washington, D. C.
June 6—Reliability run; Washington Post.
*June 8—Track meet; Quaker City Motor Club; Narbeth, Pa.
June 15—Track meet; Belmont Motor Club; Narbeth, Pa.
*June 20—Algonquin hill-climb, Chicago Motor Club; Algonquin, Ill.
*June 20-22—Reliability run, Pine Tree Motor Contest Association; Portland, Me.
June—Reliability run; Auto Club of St. Louis, St. Louis, Mo.
June—Hill climb; Maine Automobile Association; Portland, Me.
June 27-28—Interclub match, Chicago Athletic Association and Chicago Athletic Club.
June—Track meet; Baltimore, Md.
June 27-29—Summer meeting Society of Automobile Engineers; Detroit, Mich.
July 4-5—Track meet; Taylor Automobile Club; Taylor, Tex.
*July 4-6—Beach meet; Old Orchard Automobile Association; Old Orchard, Me.
July—Reliability run; Maine Auto Association.
July—Reliability run; Cleveland News.
July—Reliability run; Cleveland News.
July—Road race; Riverhead, L. I.
July 4—Track meet; Petersburg, Ind.
July 5-6—Road Race; Montamara Festo Auto Com.; Tacoma, Wash.
July 10-20—Canadian Industrial Exhibit; A. C. Emmett, manager motor section; Winnipeg, Can.
July 15—Reliability run; Wisconsin State Automobile Association; Milwaukee, Wis.
July 22-27—Cadillaqua celebration at Detroit, Mich.
*August 8-10—Galveston beach meet; Galveston, Tex.
*August 23-24—Road races; Chicago Motor Club; Elgin, Ill.
*September 2—Speedway meet; Indianapolis, Ind.
September—Track meet; Universal Exposition Co., St. Louis, Mo.
Sept. 23-Oct. 3—Rubber show, Grand Central palace, New York.
October 5—Fairmount Park road race; Quaker City Motor Club; Philadelphia, Pa.
*October 7-11—Chicago Motor Club reliability run; Chicago.
October 12—Track meet; Rockingham park; Salem, N. H.
November 6—Track meet; Shreveport Automobile Club; Shreveport, La.
*Sanctioned by A. A. A.

Twenty-Seven Final Hoosier Count

Lists for 500-Mile Race on Indianapolis Speedway Close With Good Field Brought Together—Nineteen Different Makes Represented—New Case Car Given Tryout

INDIANAPOLIS, IND., May 6—The final count of entries for the 500-mile race on the speedway May 30 shows twenty-seven cars nominated, four names having been added to the list that was published in last week's Motor Age—a second Lozier, entered by O. Applegate, a New York owner, which is to be driven by Joe Matson; an unknown for which a reservation was made and the fee paid; a Continental, entered by F. N. Martindale, to be driven by Johnny Jenkins, the former Cole driver, and an entry made by F. S. Duesenberg of the Mason Motor Car Co., of Des Moines, Ia., which will be driven by Rupert Jeffkins. The Duesenberg entry is the smallest in the race, the car weighing 2,000 pounds and having a piston displacement of only 240 inches.

This makes a field of nineteen different makes, six of which were not in last year's race—the Lexington, White, Schacht, Opel, Continental, Sears and the unknown. Of those in last year the Marmon, Amplex, Jackson, Inter-State, Velie, Benz, Pope-Hartford, Apperson, Cole, Westcott and Alco are not in this time. The field is smaller than last year—twenty-seven as against forty-four last year, forty of which started, twelve finishing.

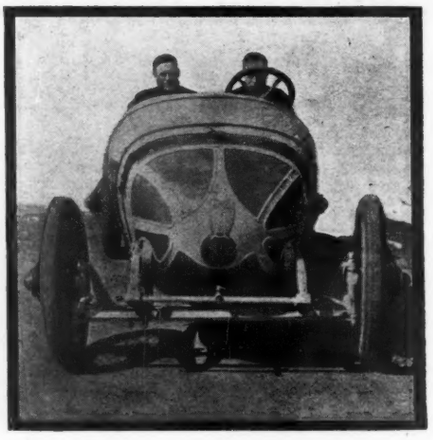
There have been several changes among the drivers over last year. For instance, Mulford, who was in a Lozier, now is in a Knox; de Palma is driving a Mercedes instead of a Simplex; Merz is in a Stutz instead of a National; Burman drives a Cutting in place of a Benz; Bill Endicott has switched from a Cole to a Schacht; Knight is in a Lexington, whereas last year he had a Westcott; Disbrow is in a Case instead of a Pope-Hartford; Tetzlaff has jumped from the Lozier to the Fiat; Anderson in a Stutz, Hughes in a Mercer, Frayer in a Firestone-Columbus and Marquette in a McFarlan, are driving the same cars. Zengel, Herrick, Herr, Dingley, Barndollar, Liesaw, Horan and Matson are in the big race for the first time.

There is considerable mystery hedging the entry of the unknown. The nomination was made the last day and by telephone. The nominator desired his identity kept secret until he has satisfied himself as to the speed of his car, which is one he built himself. He is an Indianian and says that if the car cannot make good in practice he will not make his name public.

In numbering the cars for the big race, the management has left out 11, 13, 20 and 30. Nos. 11, 20 and 30 are left out to make scoring easier, it having been proven that 1 and 11, 2 and 20 and 3 and 30 often are confused. No. 13 is the hoodoo number and so is abandoned.

Practice started following the closing of the entries and one of the first out was the new big Case which was driven by Eddie Hearne, which showed something like 87 miles an hour in the straights. Hearne declares himself much impressed with the work of the car, but complained of tire troubles, brought about, he thinks, by the smallness of the demountable wire wheels, which carry 32 by 4½-inch tires. The car weighs about 3,500 pounds and Hearne believes larger tires and wheels are necessary, so a cable order has been sent to England. It is expected it will be possible to get the new wheels here in time for the race. The other Case, which is at the factory, is being overhauled in order that all the weight possible may be taken off because of Hearne's experience here this week.

EDDIE HEARNE IN THE NEW CASE RACER



FRONT VIEW OF CASE

The White six, which is making its racing debut, is reported to be moving sweetly and showing considerable speed. In addition the native cars, the National and Stutz, have been burning up the track as usual in practice.

The racing men discovered that the track is if anything smoother than last year. They also found out that the winter had caused the track to expand 4 or 5 inches under the bridge at the head of the home stretch. The expansion was so great two rows of brick were blown out in the upheaval caused by the spring thaw. This hole has been almost closed by the expansion.

There are rumors around that possibly David Bruce-Brown will drive the third National that has been nominated, and it also is said Barney Oldfield will have the wheel of the Opel, despite the declaration made several months ago by Carl Fisher that the former speed king would not be allowed to race on the speedway.

FORD IN TARGA FLORIO

Paris, April 24—Three Ford cars, two Isotta-Frachini, two Lancias, two Scats, a Mercedes, a Renault, and an Alpha already have been entered for the Targa Florio race to be run round the island of Sicily on Sunday, May 26. The race, which has been held annually since 1906, is open to all types of cars, providing they have two seats side by side. The start will be given at midnight outside Palermo, and a complete round of the island will have to be made over 630 miles of dangerous winding mountain roads, in a time limit of 48 hours. The difficulties of the course are so great that the average speed will not be high, probably not much more than 30 miles an hour. It is because of the special nature of the road that pure racing models are not being entered, and probably the only specially-built racer will be Ceirano's S. C. A. T. The most important prize consists of the Targa Florio, a valuable object of art offered by Vincenzo Florio, with silver trophies and money prizes for the drivers. Up to the present this race has always been won by an Italian car, the holders of the trophy being Cagno, Itala; Nazzaro, Fiat; Trucco, Isotta-Fraschini; Cuippa, S. P. A.; Cariolata, Franco; Ceirano, S. C. A. T.

Farmers Interested in Texas Tour

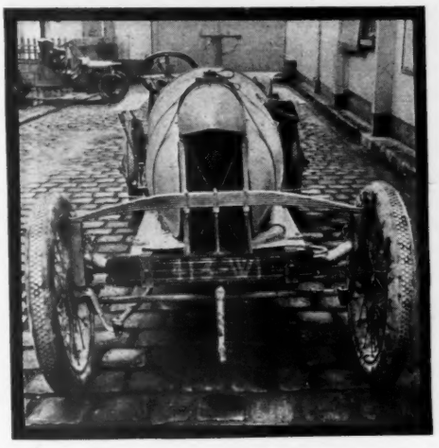
Contests Arranged for Residents of Rural Districts Promises to Stir Up Interest in Roads Among the Men Who Can Help—Lozier Challenges Packard to Race

GEORGE SIZAIRE IN SIZAIRE-NAUDIN, FRENCH GRAND PRIX ENTRANT

DALLAS, TEX., May 4—The tour that has been organized for the farmers and ranchmen of Texas will be held in August, the time the southern farmer is least busy, and will cover about 1,000 miles and take in the principal cities of the state.

This tour is under the direction of Farm and Ranch, of Dallas, with the sanction of the A. A. A. and the approval of the state and local associations. The rules, which have been formulated by the first named body, will be as simple and nontechnical as possible to suit the especial character of this run. Only farmers and ranchmen who live on and operate their own farms and ranches and who own and drive their own cars are eligible, and it is desired to bring out the utility of the motor for the rural sections, and not so much the technical perfection from a manufacturer's standpoint that has ruled all tours hitherto.

The dealers of the state are coöperating enthusiastically to make this a success, for they realize what a tremendous impetus the run will give to the sale of cars throughout the southwest, and what better feeling will be created between the motorist and the farmer.



FRONT VIEW OF SIZAIRE

The official pathfinder and press cars left Dallas May 2 over the proposed route. When the scouts return with a full report of the conditions to be met the exact route for the tour itself will be announced and the official entry blanks issued. Already many owners have signified their intention of entering, and the indications point to more than 100 cars contesting. Farm and Ranch has put up $1,000 in cash and a large silver cup, and many other companies and individuals are offering special prizes, so that the trip will not only be one of pleasure and instruction for all who enter, but quite profitable for the lucky contenders.

LOZIER CHALLENGES PACKARD

Detroit, Mich., May 7—H. A. Lozier, president of the Lozier Motor Co., has invited Henry B. Joy, president of the Packard Motor Car Co., to enter one or more Packard cars in either the Elgin road races or engage in a match on the Indianapolis speedway to settle the question of supremacy. A formal letter to this effect has been sent to Mr. Joy by Mr. Lozier.

"In your advertisements of the Packard you claim to have a six-cylinder motor of 74 horsepower possessing the greatest flexibility; you claim the Packard car will travel 1,000 miles or 100,000 miles on any road in the world in less than any other car; you assert that it will run the longest without mechanical attention, and that it is the safest car," writes President Lozier. "These claims are identical with those which we have made for the Lozier car, and it is obvious that either you or we are wrong in our contentions.

"We have withdrawn from speed and endurance contests, but if you will enter one or two stock cars at Elgin, Ill., in the national stock chassis championships in August, we will meet you and afford you the opportunity of proving your claims. If you are opposed to racing on public roads or feel that the 300-mile contest at Elgin is not sufficiently strenuous, we invite you to meet us in a 1,000-mile race on the Indianapolis speedway, provided the A. A. A. sanction can be obtained for a stock car contest of this distance."

As yet no reply has been made by Mr. Joy.

MEET BILLED AT NARBERTH

Philadelphia, Pa., May 4—Entry blanks will be issued next week for the annual spring race meet of the Quaker City Motor Club, to be held on Saturday, June 8, at the Belmont Driving park, Narberth. Nine events are scheduled for the afternoon and special features will be introduced, among them record trials, one to 25 miles, for 1-mile dirt track. Three weeks later the recently organized Belmont Motor Club will also conduct a meet on the same track, it is announced.

ENTRANTS IN 500-MILE RACE ON INDIANAPOLIS SPEEDWAY

No.	Car	Cyl.	Bore.	Str.	P. D.	Driver	Entrant
1	Stutz	4	4¾	5½	389.9	Anderson	Ideal Motor Car Co.
2	Stutz	4	4¾	5½	389.9	Zengel	Ideal Motor Car Co.
3	Fiat	4	5	7.48	589	Tetzlaff	E. E. Hewlett
4	Mercedes	4	5.12	7.09	583	DePalma	Ralph DePalma
5	Case	6	4 23/64	5	447.8	Disbrow	J. I. Case T. M. Co.
6	Case	6	4 23/64	5	447.8	Herrick	J. I. Case T. M. Co.
7	Mercedes	4	5.12	7.09	583	Wishart	Spencer Wishart
8	National	4	5	7½	589	Wilcox	Nat. Motor Vehicle Co.
9	National	4	4⅞	6	448	Herr	Nat. Motor Vehicle Co.
10	Lexington	6	4⅛	5¼	421	Knight	Lexington Motor Car Co.
12	Simplex	4	5¾	5¾	593	Dingley	Bert Dingley
14	White	6	4¼	5¾	489	Darndollar	White Indianapolis Co.
15	Cutting	4	5 7/32	7	597.9	Burman	Clarke-Carter Auto Co.
16	Firestone-Columbus	4	5	5½	432	Frayer	Columbus Buggy Co.
17	Marquette-Buick	4	6	5¼	594	Liesaw	Will Thomson
18	Schacht	4	4¾	5½	389.9	Endicott	Schacht Motor Car Co.
19	Knox	6	4.8	5½	597	Mulford	Ralph Mulford
21	Mercer	4	4¾	5	300	Hughes	Mercer Auto Co.
22	Lozier	4	5⅜	6	544	Horan	Dr. W. H. Chambers
23	McFarlan	6	4¼	5	425	Marquette	Speed Motors Co.
24	Opel	Specifications not given				Unnamed	Opel Auto Import Co.
25	Lozier	4	5⅜	6	544	Matson	O. Applegate
26	Special	Specifications not given				Unnamed	Name withheld
27	Continental	4	4¼	4½	286.3	Jenkins	N. Martindale
28	Stutz	Specifications not given				Merz	Ideal Motor Car Co.
29	National	4	4⅞	6	448	Unnamed	Mason Motor Co.
31	Mason	4	3 15/16	5	240	Unnamed	Nat. Motor Vehicle Co.

French Would Number Country Roads

Experiment Being Tried to Make Route-Following Easier for Tourists—Demand Made that Authorities Improve Surface of Highways—Sunflower Trail Association Officered

PARIS, April 24.—With a view to simplifying travel, an experiment is now being made in France with a system of numbering all highways. Officially all French roads are classified and numbered, but advantage is rarely taken of this classification by tourists. For instance, as the numbered national highways start from Paris and run to various distant towns, it is necessary only for the long-distance tourist to note the number of the highway he must follow to be sure that he is on the correct route. The same applies to departmental highways, chemins de grande communication, vicinal roads, etc.

Letter Scheme Suggested

By the scheme now being experimented the letter or letters indicating the classification of the road, also its official number, are placed very conspicuously on all sign and mile posts, the distance to the nearest town is given plainly, and the name of the district on which the sign is erected is carried in smaller letters. If such a system is fully developed the motor tourist through France will act in the same way as a stranger finding his way through an American city, guiding himself by the names and numbers of the roads, and ignoring towns and villages just as the traveler in a town ignores houses and buildings.

A tour would be worked out in the following way: "N. 2, 329 miles; D. 4, 25 miles; G. C. 45, 2 miles; No. 10, 8 miles," meaning, follow national highway No. 2 for 320 miles, departmental highway No. 4 for 25 miles; chemin de grande communication No. 45 for 2 miles; national highway No. 10 for 8 miles.

In this way the most complicated tour could be followed with certainty and without any necessity for asking directions. The change would be slight, for the official numbering exists at present, and the experiments carried out in the neighborhood of Vichy show that the benefits are appreciable.

France Wants Better Roads

France wants better roads and is determined to have them. It is universally recognized that from an engineering standpoint the roads of France are the finest in the world. But owing to the enormous increase of traffic of all kinds, and particularly of motor traffic, the surfaces are no longer equal to the task imposed upon them. With roads laid out so that there is practically no limit to speed, there is a strain on the French road surface which is unknown in countries where speed limits are enforced and unfavorable natural conditions prevail.

France possesses 250,000 horse-drawn vehicles, nearly 70,000 motor cars, between 7,000 and 8,000 commercial vehicles, and practically 3,000,000 bicycles. In addition several thousands of foreign motorists tour over French roads every year, and there is an indetermined number of country motorbuses and sight-seeing vehicles. With the increase in traffic there has been no increase in the allotments for road maintenance, with the result that the more important routes across France are rapidly falling into a most unsatisfactory condition. In the mountains and such districts as have remained untouched by modern conditions the road surfaces are still perfect; but the main routes, and particularly the important highways radiating from Paris are in need of repair.

The Automobile Club of France, acting through its touring commission, has tackled the problem, and has secured the co-operation of the Automobile Manufacturers' Associations, the Touring Club of France, the provincial motor clubs, hotel keepers' association, and the U. of C.

Monster Petition Preparing

It is recognized that the problem is too great to be tackled by them financially, and the movement has taken the form of a monster petition to parliament in favor of immediate amelioration of the road system. The petition points out that the good roads of France have contributed largely to the development of the motor industry; that by bringing in tourists from all quarters of the globe they have wonderfully improved the hotel business, and that the development of motor passenger-carrying lines has brought a new source of wealth to many hitherto impoverished districts. The necessity of maintaining a high standard of road efficiency is enforced in the petition, but the initiative is left to parliament. It is recognized that the amount on road maintenance must be enormously increased, and that as all improvement will benefit the nation at large, the cost should be borne by the whole community, and not by localities.

When an imposing number of signatures have been obtained to the petition, parliamentary action will be taken, and as many of the road surfaces will have to be entirely remade, it is probable that funds will be obtained by means of a loan. The beginning of the touring season has been selected as the most suitable time for obtaining signatures to the good roads petition, and if, as is hoped, the lists are filled by June, parliamentary action will be taken this summer, with the possibility of practical reform work before the end of the year.

It long has been recognized in France that the ordinary macadam road, even with the advantage of tar treatment, is altogether inadequate where very heavy and fast traffic has to be carried. Consequently a number of the main roads out of Paris are now being relaid with smooth granite blocks. A solid cement foundation is first laid, and on this smooth, small, granite blocks are carried, without any camber. With a sufficiently solid foundation the crushing effect of steel tires and heavy axle loads is very slight, while the fastest motor traffic is powerless to destroy such a surface. Being flat, the whole of the road surface is available for traffic, and although there is not quite the same grip for horses as with macadam or rough pavé, this is a very slight disadvantage compared with indestructibility, dustlessness, and perfect rolling surface obtained. The only disadvantage is that such a road is costly to construct.

SUNFLOWER TRAIL OFFICERED

Beloit, Kas., May 4—The Sunflower Trail Association held its annual meeting in this city and elected officers, choosing R. M. Anderson of Beloit, president; Dr. R. B. Robinson of Ellinwood, vice-president; Frank A. Lutz, secretary, and L. A. Mergen, treasurer.

Delegates from Formosa and Randall to the northeast and Glasco and Minneapolis to the southeast were in attendance on the meeting, asking that cut-offs of the Sunflower trail be established through their towns. The cut-off to the southeast would extend from Beloit through Simpson, Glasco, Delphos and Minneapolis to Salina, at which point it would connect up with the Golden Belt, making an ideal motor road between Denver and Kansas City for the entire distance by way of the Golden Belt from Kansas City to Salina; by way of the Sunflower Trail from Salina to Beloit, Cawker City, Portis, Smith Center to Minden, Nebraska, on the Omaha-Denver transcontinental route and over this latter trail comprised of the splendid state highways of Nebraska and Colorado to Denver.

The Sunflower trail is 248.7 miles in length and passes through Kearney, Newark, Minden, Macon and Franklin in Nebraska and Reamsville, Smith Center, Portis, Downs, Cawker City, Glen Elder, Beloit, Victor, Vesper, Wilson, Claflin and Ellinwood in Kansas. The trail is the connecting link between the Platte valley transcontinental route at Kearney, Neb., on the north and the Santa Fe trail to California on the south at Ellinwood. It also crosses the Omaha-Denver route and

Crop Reports Barometer for the Trade

at Wilson and Salina it intersects the Golden Belt route from Kansas City to Colorado. The Sunflower trail is marked with 18-inch yellow bands around the telephone poles for the entire distance. It promises to be one of the most popular routes through this territory. Certain it is that it has many enthusiasts working in its interests.

BIG ROAD CONGRESS PLANNED

Milwaukee, Wis., May 4—The first American road congress, in which four great organizations which heretofore have met and worked separately will conjoin, is practically located at Milwaukee. Charles P. Light, of Washington, D. C., spent several days in Milwaukee last week to look over the ground and received a highly favorable impression. The Milwaukee Automobile Club is co-operating with the Citizens' Business League, the Milwaukee convention bureau, in locating the convention at Milwaukee. The four bodies which will join in the congress are the American Automobile Association, American Highway Improvement Association, American Road Builders' Association and American Road Machinery Association. Dates have not been decided. The Milwaukee Auditorium has been placed at the disposal of the congress for its sessions and for an exposition of machinery and tools. The M. A. C. is planning a series of entertainments at its country clubhouse for the guests at the congress during the convention session.

NEW ILLINOIS ORGANIZATION

Bloomington, Ill., May 6—The Illinois Valley Automobile Association was formally launched at a meeting in Ottawa when a constitution and by-laws were adopted, seventy-five charter memberships recorded and officers elected, as follows: President, H. W. Johnson; first vice-president, F. W. Neff; second vice-president, R. K. Knapp; secretary, Wayne Hummer; treasurer, A. J. Neurether. Applications from 100 additional owners who wish to become allied with the new organization were received.

The object of the new organization is to advocate reasonable and non-discriminating regulations in the use of self-propelled vehicles; to encourage and assist in the construction and maintenance of good roads and to promote the establishment and location of state highways through the Illinois valley. It looks like a progressive organization.

It was voted to sustain the action of the Illinois Highway Improvement Association, in favoring the construction of main roads under the direction of the state highway commissioners, and resolutions were adopted which will be sent to Governor Deneen and members of the legislature.

Forecast Shows Cotton Acreage Will Not be as Great as Last Year—Government Declares Winter Wheat Will Not be So Heavy—Drawbacks Granted by Treasury

NEW YORK, May 7—Although May 1 is too early to definitely calculate on the cotton crop for the coming season, it is a certainty that the number of acres devoted to cotton this year will not be as great as last year. Definite information will be obtained soon after June 1. At present the season is from 10 to 20 days later than last year owing to the unfavorable wet weather which has characterized practically the entire cotton-growing states, which include Texas, Mississippi, Louisiana, Florida, Georgia, Alabama, South Carolina, North Carolina, Tennessee, Missouri, Arkansas and Oklahoma. Of all of these states, according to an investigation made by the Journal of Commerce, Louisiana is the only one that will have a larger acreage of cotton this year than last. The acreage in Texas will be approximately the same as a year ago, but in all of the other states heavy decreases are looked for. Mississippi, Louisiana and Arkansas have suffered severely from the recent floods.

Some interesting information on the length of time required for the growth of the cotton crop has been given, which is as follows: From the beginning of planting to the beginning of picking the time in the different states is as follows: Tennessee, 136 days; North Carolina, 139; South Carolina, 142; Arkansas, 144; Georgia, 144; Mississippi, 147; Missouri, 150; Louisiana, 150; Texas, 15; Florida, 153.

TREASURY GRANTS DRAWBACKS

Washington, D. C., May 6—Drawback has been allowed by the federal treasury department under section 25 of the tariff act on tire treads known as Woodworth's treads, manufactured by the Leather Tire Goods Co., of Buffalo, N. Y. The regulations prescribe the allowance of drawback shall not exceed the number of rivets shown in the sworn schedule of the manufacturer, filed with the collector of customs at New York.

The regulations of the treasury department at Washington, dated October 22, 1906, providing for the allowance of drawback on motor cars manufactured by the Peerless Motor Car Co., of Cleveland, with the use of imported castings, ball bearings, spark plugs and other imported parts and materials, have been amended to cover motor cars and motor trucks manufactured by this company with the use of imported bearings, in accordance with its sworn statement, filed with the collector of customs at Cleveland.

The treasury department at Washington has directed an appeal from the recent decision of the board of general appraisers as to the duty on leather strips for motor car treads. The appeal has been filed with the court of customs appeals. It appears that the articles come in lengths suitable for making the treads in tires; that they are beveled and that no further labor is necessary to adapt them to their special use except that they are filled with studs to prevent slipping. Duty was assessed upon the merchandise under paragraph 452 of the tariff act at the rate of 40 per cent ad valorem, and the board sustained the protest of the importers that it was properly dutiable under paragraph 451 of said act, at the rate of 5 per cent ad valorem and 10 per cent ad valorem under the first and last provisions of the said paragraph.

GOVERNMENT WHEAT REPORT

Washington, D. C., May 8—Special telegram—According to the government monthly crop reports as of May 1, the acreage of winter wheat is 25,744,000, a decrease of 3,418,000 acres from last year, or 11.7 per 3,118,000 acres from last year, or 11.7 per cent. The condition of the crop was estimated at 79.7 as compared with 86.1 May 1, 1911, and a 10-year average of 85.2. The government estimates the crop at 370,714,000 bushels.

In several of the big wheat-producing states the condition of the crop is above the average, as follows:

State	Acres	Condition 1912	Condition 1911	10-year average
Oklahoma	1,522,000	87	67	82
Texas	704,000	93	83	77
Montana	291,000	95	98	..

The greatest decreases in acreage were found in Illinois, Indiana, Ohio and Michigan, where the poorest conditions of crop were also encountered.

ATLAS FINED FOR CONTEMPT

New York, May 8—Special telegram—Judge Lacombe of the United States district court of the southern district of New York has imposed a fine of $50 upon the Atlas Chain Co. through its president for contempt of court in violating the decree forbidding the company from making or selling tire chains in conflict with the product of the Weed Chain Tire Grip Co. under the Parsons patents. At the hearing it was pleaded that the order was misconstrued by the defendants.

NEW POPE CAR

Hartford, Conn., May 7—The Pope Mfg. Co. confirms the rumor that it will add a new model to its line, but refuses to give out the specifications. It is reported that the newcomer is to be a member of the medium-priced family.

Floods Mar Central States' Prospects

Pessimistic View Held By Dealers in Illinois, Iowa, Wisconsin and Minnesota Because of Backward Spring—Many Cars in Stock Because of Road Conditions

SPRINGFIELD, Ill., May 6—Nearly 2,500 car dealers, in a quarter as many distributing centers in Illinois, Iowa, Wisconsin, Missouri and Minnesota, are facing the greatest crisis in the history of the business in the central states. Stocked to the doors since last fall, and having bought more cars through the long, hard winter, in anticipation of an early spring buying, a great majority of the dealers find themselves, because of floods, hurricanes and bad roads, in a position trying to the most optimistic.

Sales usually made during the spring are lacking. Farmers and country people generally, who just before plowing and planting, and who heretofore have bought cars freely, have not been seen or canvassed with a view of making sales; and the flocks of car salesmen and demonstrators, usually seen on the country roads as early as duck-flying time, are strangely absent.

Bad roads, excepting in isolated cases, have put the selling season of 1912 so far backward that it seems as if the business would hardly recover in time for 1913 business. Few cars have been sold, but the dealers are hard-pressed for money because the cars cannot be delivered if sold. Not only are the dealers hard up against it, but the manufacturers' representatives, oil salesmen, tire salesmen, accessory and specialty men report nothing doing; in fact, a prominent distributor said only the other day that the landlord is the only man making money in the motor car business in this section so far this year.

Since September 15, when the heavy rains began, dealers in certain sections of the five states were forced indoors. Then, with the colder weather, the roads began freezing, making traveling rough and uncomfortable. Prospects, usually brave and anxious to see the new 1912 models, passed them up. Five months of snow and cold weather, until nearly April 1, saw the majority of the dealers still hanging around the fires in their offices and garages. April 1 began prettily, but snow and storms, heavy rains, flooding rivers, with scarcely a dry road in the entire five states, blocked sales again; and even with May ushered in, with balmy weather throughout the central states, finds 60 per cent of the dealers throughout the territory, particularly in the rural districts, in unusually bad shape.

Iowa, because of the state-wide interest in good roads, is in little better condition. Illinois is the worst of the lot, and one particularly prominent dealer along the Mississippi river is quoted as saying that part of his territory has been washed away, and what was left has recently been blown down by the hurricane which recently swept through eastern Missouri and central Illinois.

What is needed is more good roads. Wisconsin, with a wealth of material for road-making, is almost primitive in that respect. Central Illinois in certain sections is slowly coming to the front with dragged roads, McLean county particularly showing the greatest improvement, because of an active campaign for the building of stone roads. Missouri, being the home of the King road drag, is showing vast improvement; and Minnesota, likewise, is taking up the good roads spirit in earnest. With good weather, sunshine and dry roads in 1912 may redeem itself in the motor car business, but the elements are like the prospects, good today and bad tomorrow.

TALKS TO ELECTRIC TRADESMEN

Boston, Mass., May 4—The Electric Vehicle Club of Boston held its annual spring meeting this week and the principal address was delivered by Converse D. Marsh. After complimenting the members on the progress that had been made in the sale of electric vehicles, he gave some advice as to how the dealers may do even better in educating the public to the value of both pleasure and commercial vehicles propelled by electricity.

"One splendid way in which we can impress the public," he said, "is by building a motor mart, and I earnestly believe that this ought to be done as a proof-example for the public, to show them the power and growing force of our position. The public is impressed by success—by numbers, by concerted action. The electric motor mart will help us. Let all dealers consider this fact—each for his own greater welfare.

"Another thing we ought to do is to secure adequate parking space in the heart of the city. It is done in other big cities. The importance of these two aids to greater progress should warrant the support of each and every member of this club given actively—personally.

"One other point is of even greater vital importance, and that is to impress the public through co-operative advertising to show in a strong, unmistakable manner the success that the electric is meeting with everywhere. It will take a united pull by both freight and passenger interests among us—all acting for the common good, in order that each individual may profit to the greatest extent—to bring about a strong impression upon the public mind."

TRADE OUTLOOK IN TEXAS

Dallas, Texas, May 4—With one of the brightest prospects Texas has ever had for perfect crops, dealers of Dallas are predicting one of the most successful seasons the southern states ever has had. L. B. Alford, local manager for the Studebaker, declares the year has, so the last month, been one of unprecedented sales. He reports that seven carloads of machines have been received in Texas during the past week. Manager Atwood of the Buick branch, who has just made a tour of the northern part of the state, says that farmers have begun to put in use the motor truck and he predicts this to be the beginning of possibly the greatest year his company has ever had in the south. He says Texas farmers have awakened to the good uses of the motor truck, especially where roads are kept in the condition as they are in many of the northern Texas counties.

BALTIMORE OUTLOOK BRIGHT

Baltimore, Md., May 5—The local dealers are enthusiastic over the showing of sales during the month of April and believe that it is a forerunner for one of the

Reports from Bankers in all Parts of Country

CHICAGO, May 7—If the buying capacity of America in the touring car and also the commercial car field can be judged from the financial condition of the country, then sales should be plentiful from this date on to the end of the 1912 fiscal manufacturing year, which is June 30. R. G. Dun & Co. in their report for bank exchanges during the month of April in returns from 127 centers of population throughout the country show an increase of 21.2 per cent as compared with April of last year, and 6.9 per cent as compared with April, 1910. The biggest increase is shown in New England states, the southern states, the central west and south Atlantic. The increase in the middle states is lower, that in the western states occupies second lowest position and the Pacific states third lowest.

The bank report from the state of Kansas, covering 896 state banks, shows an increase in deposits since the first of the year of $1,753,751. The total deposits amount to over $102,000,000. State Bank Commissioner Dolley considers the financial condition of the state in a healthy condition and satisfactory in every respect. This satisfactory banking condition, taken in conjunction with the estimated market reports of the state, augurs well for Kansas trade during the coming

May Brings Joy to New Englanders

In and Around Boston Dealers Are Looking for Better Business After Severe Winter—Bad Weather Prevents Demonstrations and Consequently Slows Car Sales

BOSTON, MASS., May 4—The advent or May brought joy to the hearts of the motor dealers, in Boston particularly and New England in general, because it presaged more activity in the sales of cars. The present spring has not been quite so productive as it might have been for some of the dealers.

Not that the sales have dropped off, but that the general increase that was expected, compared to other years, did not fully materialize. There are some dealers who can show a substantial increase, but even these men believe that with an ordinary winter and spring conditions would have been better.

The past winter has been such a severe one that many prospective motorists have not yet got the chill out of their bones. And the roads have been buried deep in snow, so that when the first warm spell hit them the highways not taken care of by the state, and made of gravel and dirt, became quagmires in some places.

The result of this has been that the men who felt like buying have been waiting for better weather. They want to drive their cars home over the road if they buy in Boston, and to do this weather and road conditions must be good.

The sudden change for the better since May day has been a remarkable transformation, and for the past few days the conditions for motoring in and around Boston have been ideal. Out in the country the sun is drying up the roads, too, so that they will be in good shape shortly.

Then the increase in sales will start. Had these conditions prevailed in April as they did in past years, all the dealers would have been kept hustling, booking orders and making deliveries. The bad conditions have been a help to some of the dealers who could not get their cars through because of the shortage of railroad cars, but these have been in the minority.

As a general average, it has been figured out that the loss due to these weather conditions, which also prevented real demonstrations being given, has totaled perhaps about 25 per cent. But with May and June sure to bring nice weather, this loss will be made up. This 25 per cent loss, it must be remembered, does not mean a decrease from last year's business, but from what would naturally be expected had things been different.

However, once the touring season starts, and that will be very shortly, the sight of scores of cars whirling about New England will give an impetus to motor sales. Even now it is not unusual to see any day at least a dozen cars from other states in front of some of the principal hotels. That this will be a big year for touring there is no question, as conditions have been brought about to aid it.

The admission of New England motorists to New Jersey without having to take out registrations and licenses means that a lot of motorists from this section will tour the Jersey coasts this year who went elsewhere in the past, primarily to the Adirondacks and Canada. With good cars and experience in touring, many of these will stretch their trips to include all three sections.

The ban having been removed on New Jersey motorists in New England, the visitors from the former state who were conspicuous by their absence the past 2 years will now find it advantageous to make trips along the famous north shore of Massachusetts and then on into the White mountains to Bretton Woods, the Rangeleys, and veering off then either to Quebec or through Vermont to Montreal seeking new scenes. It will be beneficial for everyone.

GAUTEMELA AGENT BACK

Boston, Mass., May 6—George R. Emerson of Boston, who now sells Marmon cars in Guatemala, is back home visiting for a few weeks. He says that the motor business in the South American states is growing very largely and that American cars are now making much headway there. The roads are being improved and there is a big demand for used cars, he states, due to the cost of freighting machines there. The freight cost makes a second-hand car cost about as much there as it does when new in this country. In spite of that many new cars are being sold there.

greatest years enjoyed by them in this territory. Dealers almost to a man declare that there were more motor cars sold in Baltimore during April than during any other month in the history of the local trade. They declare that while business was fair during March and several other months, that it took an unexpected spurt in April, which leads them to believe that Baltimore is bound to become one of the big motor car cities of the country.

MOLDERS ENJOINED

Buffalo, N. Y., May 7—Judge Hazel in United States district court has granted an injunction restraining local 84, International Molders' Union of North America and its members from interfering with the operation of the Aluminum Castings Co., which makes aluminum castings for local motor car factories, and at which plant there has been for 3 weeks a strike of molders and coremakers. The injunction was issued upon the application of officers of the local company and Deputy United States Marshals Doty and Conkling served the orders to the union. Failure to comply with the court's decree will mean the arrest of the violators and their arraignment before Judge Hazel in contempt of court proceedings.

LOZIER TO MAKE ONLY SIXES

Detroit, Mich., May 4—The Lozier Motor Co. formally announced this week that hereafter it will make only six-cylinder cars, having discontinued the manufacture of fours, a step first taken by Winton and later followed by the Pierce-Arrow. As the reason for this step, Sales Manager Emise says: "The trend of popular taste in motor cars has been well illustrated in the past 2 years by the decreasing sale of high-priced four-cylinder cars. Our own experience along that line is an example. Last season we sold on an average of five cars of the six-cylinder type to every one of the four-cylinder models. This settled any doubts we may have had as to the abandonment of fours in 1913."

Promise Good Year for Motor Car Dealers

months. The market report shows an estimated crop of 90,000,000 bushels as compared with 54,000,000 last year.

Bank reports throughout the northwest show the financial conditions in an improved condition, the bank deposit showing an increase of $1,000,000 during the 2 months from February 18 to April 18 this year. The volume of business in this territory, as reflected through the banks, is estimated as $10,000,000 more than that done a year ago during the same 2 months.

In bank reports from the Pacific coast states favorable increases are shown. In sixteen banks in Spokane, Wash., business shows an increase of $6,000,000 during the last year. All of the national banks in southern California show gains in deposits, the Los Angeles banks alone recording an increase of over $14,000,000 during the year.

In Iowa all records have been broken for increase in deposits of the state banks, trust companies and savings banks. In the last 10 months these show an increase in deposits of over $23,000,000, which is the greatest increase ever shown in a 10 months period in the history of the state. Deposits increased over $7,000,000 between February 7 and April 3 of this year. In the state are 720 savings banks, 282 state banks and 14 trust companies.

Routes and Tourin

OVER the erstwhile happy hunting ground of the American Indian, motor tourists from all parts of the country drive their cars for days and satisfy their appetites for beautiful scenery in the three magnificent public parks of Louisville, covering in all more than 1,200 acres. Mile after mile of splendid macadam roadway passes through this veritable wonderland and offers the most discriminating motorist a trip he will never forget.

Not considering Mammoth Cave, the famed Bluegrass section of Kentucky, the Lincoln farm, near Hodgenville, where Abraham Lincoln was born, and other points of interest out in the state, a trip through Louisville's parks alone would more than repay the costs of the journey. It is befitting that Kentucky's parks should be named after the followers of Nimrod in the three Indian tribes who roamed the country, before its settlement by the white men, in search of wild game. So they were designated Cherokee, Shawnee and Iroquois.

Upon high, rolling, picturesque land at the eastern borders of the city is Cherokee park, the most beautiful natural park in the country. Its surface is graceful, undulating, and through it flows the middle fork of famous Beargrass creek. Climbing the winding hills within the park is a delight long to be remembered by the tourist. There is no semblance of monotony. Besides the forest trees, flowers, both wild and cultivated, grow there in profusion. Cherokee park covers an area of 400 acres. Here nature is revealed to the motorist in all her moods.

From the center of Louisville's business section to the entrance, the distance is 4 miles and most of the route is over asphalt-paved roads. The main entrance is situated at the northwestern border of the park. Passing into the wonderland, the motorist drives his car up a long hill. To the north is the public golf course, and the exponents of the old Scottish game add color to the scene with their costumes of many colors.

Should the royal and ancient game have no attraction for the tourist, he should keep his car on the road skirting the south end of the course. As 11 miles of macadamized roadways twist and turn about through the grounds it would not be advisable to suggest any certain route. There are pavilions, beautiful lagoons, a skating pond, tennis courts, the statue of Daniel Boone, the Hogan drinking fountain, swards and valleys, hundreds of squirrels, that make their home in the big forest giants, rustic benches, comfortable seats, and carefully nursed shrubbery. Nature offers the motorist a panorama of beauty that cannot be found elsewhere.

DANIEL BOONE MONUMENT, IN CHEROKEE PARK, LOUISVILLE, KY.

One of the favorite drives for motorists is to Iroquois park over Third avenue and Southern parkway or Grand boulevard, which affords a charming spin of 6 miles that may be enjoyed throughout the year. This parkway is one of the handsomest approaches to any park in this country according to tourists. Its entire width is 120 feet.

Louisville is built upon a level plain bounded on the north and west by the Ohio river. To the southward this level plain extends several miles unbroken save by two wooded hills or knobs, as they are called in Kentucky. One of these hills, covered to the summit with forest trees, is Iroquois park. A network of macadamized roads, nearly 5 miles in length, offers

AUSTIN TO ALBUQUERQUE

Austin, Tex.—Editor Motor Age—Kindly give me a route from Austin, Tex., to Albuquerque, N. M., by way of San Antonio and El Paso, also the distance. Could this trip be made with a 20 horsepower car?—C. H. Beattie.

It is 82 miles to San Antonio from Austin through Buda, San Marcos, Goodwin, New Braunfels, Selma and San Antonio. Continue to Boerne, Kerville, Ingram, Junction, Menard, San Angelo, Carlsbad, Water Valley, Sterling City and Big Spring. This distance is 202 miles.

Big Spring to El Paso is 493 miles through Stanton, Midland, Odessa, Grand Falls, Fort Stockton, Marathon, Alpine, Marfa, Aragon, Valentine, Wendell, Chispa, Lobo, Dalberg, Torbert, Grayton, Sierra Blanca, Etholen, Lasca, Finley, Fort Hancock, Fabens and El Paso.

El Paso to Alamagordo, N. M., is 100 miles through Fort Bliss, Newman, Alvardo, Desert, Dog Canon, Amlee and Alamagordo. Alamagordo to Torrance is a distance of 117 miles. Until you reach Carrizozo you travel over rough mountain pass through rock canyons, sand and chuck holes but the rest of the way, 59 miles, is good going. The towns are Kearney, Tularosa, Three Rivers, Carrizozo, Coyote, Ancho, Tecolate, Gallinus, Corona, Verney and Torrance. The first part of the trip to Albuquerque is over the plains and through sand, which is hard pulling, and the last part is over mountains, arroyos, and through canyons. The towns are Progress, Estancia, McIntosh, Moriarty, Barton and Albuquerque. It is a distance of 106 miles to Albuquerque from Torrance.

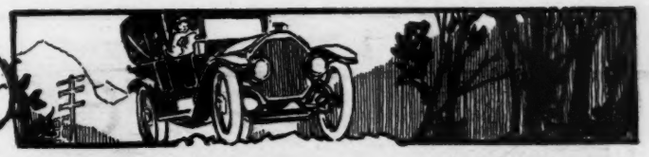
There is no reason why a 20-horsepower car cannot make this journey, if it has sufficient clearance.

CROSSING IOWA

LaFayette, Ill.—Editor Motor Age—Please give me the best route from Rock Island, Ill., to Hastings, Neb. What is the distance?—R. Sheckley.

A good road on which to cross Iowa is the Blue Grass, and by going through Davenport, Muscatine, Wapello and Burlington you travel west on this road almost on a direct line through Mt. Pleasant, Fairfield, Ottumwa, Albia, Tyrone, Chariton, Osceola, Murray Afton and Creston. The Saints highway is now traversed to the Waubonsie trail through Kent,

Information



MAIN ENTRANCE TO CHEROKEE PARK AT LOUISVILLE

abundant opportunity for the tourist to view the surrounding country. On the summit of the hill on a clear day one can see the whole length and breadth of the city and obtain fine distant prospects of the beautiful country adjacent to Louisville.

Iroquois park covers an area of 670 acres and it is estimated that 15,000 native trees stand within its borders. Tradition has it that President Zachary Taylor visited the park often and, it is said, that he carved his name on a tree which still stands there.

Shawnee park, located on the western side of the city, on the banks of the Ohio river, differs from Cherokee and Iroquois parks in that it is almost level and has considerable more area of open sward. The distance to this park from the center of Louisville is about 5 miles via Broadway, which affords an excellent driveway for motor vehicles. Shawnee park contains 214 acres extending along the banks of the Ohio, from which the view with the deep-wooded Indiana knobs beyond the opposite shore is extensive and beautiful.

These three parks of Louisville are connected by splendid wide roadways, Broadway, Cherokee road, Third avenue and Southern parkway are the connecting links. Most of the trip is over asphalt. A linking boulevard 11 miles long that skirts the southern borders of Louisville has been surveyed. It will be 120 feet wide and plans for its construction have practically been completed. The driveways in Louisville's parks are 40 feet wide and the speed limit is fixed at 15 miles per hour. No heavy traffic is allowed.

If the motorist enters Kentucky via Cincinnati, the route leads through the famous Bluegrass section of the state, rich in beautiful scenery and historic interest. One should not fail, while in central Kentucky, to tour the road that leads along the Kentucky river, which will reveal more beauties to the mile than any journey through the Berkshires. The roads are splendidly kept and fast time can be made, but to enjoy every picture the driver should take his time. A whole week might be spent profitably in the Bluegrass section. Thriving towns and growing cities offer excellent accommodations for motorists and are numerous in the central part of the state.

From Lexington and Frankfort the roads leading to Louisville are in splendid condition and the trip can be made in a short time. Frankfort is the state capital and the traveler will find much to interest him there.

While in Kentucky one should not fail to visit Mammoth Cave and Lincoln's birthplace near Hodgenville. To enjoy the trip the motorist should allow himself 2 days at least to make the journey. The distance from Louisville to Mammoth Cave is 116 miles via Bardstown, New Haven, Hodgenville, Magnolia, Bear Wallow and Cave City. Lincoln Memorial hall is situated on the old Lincoln farm, 2½ miles south and a trifle east of Hodgenville. It is 70 miles from Louisville. Memorial hall incloses the cabin in which Abraham Lincoln was born. The road leading to this historic place is now reached by an improved highway replete with magnificent views. While on this tour no one should fail to visit the Catholic institutions near Bardstown, which are among the oldest in America.

Lenox, Sharpsburg and Gravity. Follow the Waubonsie west to Ladoga, Newmarket, Clorinda and Shenandoah, crossing the river to Nebraska City, Neb. Your route now takes you over a section of the Omaha-Denver through Dunbar, Syracuse, Unadilla, Palmyra, Eagle, Lincoln, Emerald, Milford, Dorchester, Friend, Exeter, Fairmount, Grafton, Sutton, Saronville, Harvard, and Hastings.

It is something like 80 miles to Burlington; to Creston 190 miles; to Gravity, 40 miles; to Nebraska City, 65 miles; to Hastings, 161 miles.

If you prefer, you can travel on the River-to-River road from Davenport to Adel. This would take you through Wolcott, Stockton, Durant, Wilton, Moscow, West Liberty, Iowa City, Tiffin, Homestead, South Amana, Marengo, Ladora, Victor, Brooklyn, Grinnell, Kellogg, Newton, Colfax, Mitchellville, Des Moines, Waukee and Adel. The White Pole road is now followed through Erlham, Dexter, Stewart and Menlo, then to Creston, Ia., on the Blue Grass through Greenfield and Orient. From Creston follow the road as outlined in the first paragraph.

The distance on the River-to-River to Adel is 210 miles; Adel to Menlo is 22 miles; Menlo to Creston is 43 miles.

If you feel that you need running directions the Blue Book covers this territory thoroughly.

ST. PAUL TO CHICAGO

Louisville, Ky.—Editor Motor Age—I should like the best route from St. Paul to Chicago via Milwaukee.—A. E. Hopkins.

There is a good road to Westcott, Cannon Falls, Hader, Zumbrota, Pine Island, Oronoco, Rochester, Eyota, St. Charles, Utica, Lewiston, Stockton, Winona, Witoka, Ridgeway, La Crescent and La Crosse. From La Crosse to Kendall through Portland, Cashton and Ontario there is a clay road and to Baraboo it is sandy, passing through Elroy, Union Center, Wonewoc, La Valle, Reedsburg and Abelmans. The rest of the way to Madison it is macadam or gravel and in a few places it is quite rough going. Leaving Baraboo you wind through woods and continue to Prairie du Sac, Sauk City, Ashton, Pleasant Grove and Madison. The direct road to Milwaukee is level and good gravel passing through Vilas, Lake Mills, Johnson Creek, Concord, Delafield.

WINDING ROAD TO BIG ROCK, CHEROKEE PARK

Waukesha and Brookfield. Milwaukee to Chicago on the short line route is through Cudahy, Racine, Kenosha, Zion City, Waukegan, Lake Bluff, Lake Forest, Fort Sheridan, Highland Park, Ravinia, Glencoe, Wilmette, Evanston, taking Sheridan road to Chicago.

When at Baraboo do not fail to take a run to the Dells at Kilbourn. This is only 14 miles through Delton and is quite a scenic wonder.

For running directions you are referred to either the Blue Book or route book published by the Minnesota State Automobile Association.

GOING TO YELLOWSTONE PARK

San Francisco, Cal.—Editor Motor Age—I am planning a trip to the Yellowstone park this summer by motor. I desire to go by way of Seattle and Vancouver, B. C. I am going to take a complete camping outfit along and make a leisurely trip of it.—Clyde Wilkerson.

Your idea to tour to the Yellowstone park via Vancouver, B. C., is a rather wild project at the present time and such a trip is not to be recommended. However, if you want to tour to Vancouver and then return to Seattle or Sacramento over the Pacific Highway such a route is as follows: San Francisco, Oakland, Stockton, Sacramento, Roseville, Lincoln, Sheridan, Wheatland, Marysville, Oroville, Chico, Red Bluff, Redding, Pitt River Ferry, Baird Hatchery, Dunsmuir, Sisson, Edgewood, Montague, Coles, Ashland, Medford, Grants Pass, Glendale, Roseburg, Oakland, Drain, Eugene, Salem, Oregon City, Portland, Vancouver (Wash.), Lewis River, Kelso, Castle Rock, Chehalis, Centralia, Roy, Tacoma, Kent, Seattle, Bothell, Snohomish, Slivana, Mount Vernon, Bellingham, Aldergrove (B.C.), New Westminster to Vancouver.

Motor Age suggests that you return via the above route to either Seattle or Sacramento. If you wish to go to the Yellowstone via Seattle, then ship your car to Missoula, Mont., with Gardiner, Mont., the northern and official entrance to the park your destination. Of course you understand that motor cars are not permitted to enter the park; therefore you will have to garage your car outside of the park and because of this your exit from the park must be by the same route. From Missoula, Mont., to the park entrance the route is as follows: Missoula, following the Northern Pacific railroad into Bonner, the Blackfoot river to Lincoln and over the Rocky mountains to Helena, thence through Winston, Townsend, Logan, Central Park, Belgrade, Bozeman, Chestnut, Muir, Livingston; thence directly south to Gardiner.

Returning from Vancouver to Sacramento, go east over the transcontinental route through Auburn, Truckee, Reno, Fresno, Lovelocks, Winnemucca, Battle Mountain, Palisade, Elko Wells, Cobre, Montello, Lucin, (Utah). At Lucin make a detour from the main-traveled route over a good mountain road, which is well signboarded, a few miles farther north, thus avoiding the towns of Terrace and Kelton; then proceed to Curlaw, Snowville, Blue Springs and Tremonton. Here you leave the transcontinental route, turning north for the Yellowstone park via Pocatello. Leaving Tremonton you will pass through Plymouth, Cherry Creek, Malad; Malad to Pocatello, a distance of some 60 miles is over good and bad roads. Leaving Malad a climb of 1,000 feet has to be made, then it is down grade to Pocatello. Bad ditch crossings are the worst foe the motorist will encounter on this stretch. The towns are Malad, Arimo, McCammon, Onyx, Inkom, Port Neuf and Pocatello. The balance of the route into the park is via Fort Hill, Ross Fork, through bad sand into Gibson, thence into Blackfoot, Idaho Falls, Rigby, Lorenzo, Thornton, Rexburg, Salem, Best Plant, St. Anthony, Chester, Orr, Porter Ranch, Ripleys, Uden's Elk Ranch, Continental Divide, Spears Ranch, Yellowstone Park. It would not be safe to be without a complete running guide, as there are many bad stretches and steep grades.

By going further east from Tremonton through Bear River, Corinne, Brigham, Ogden, Echo, Evanston, to Rock Springs, you can then go north through Wyoming and enter the park at the southern entrance. From Rock Springs you will go through Eden, Newfork, Boudler, Pinedale, Cora, Jackson, Moran, Yellowstone park.

Volume 5 of the 1912 Blue Book series contains complete running directions of the route into Vancouver, as well as into the Yellowstone park, and by calling on the Blue Book Pub. Co., Pacific Building, San Francisco, you will receive courteous attention from Mr. Beck, representative of the Blue Book for the Pacific coast.

PLANS A TEXAS TRIP

Erick, Okla.—Editor Motor Age—I am very anxious to find out a motor car route from Oklahoma City to Fort Worth or Dallas, Tex.—President.

The accompanying map on page 23 will show the best road for motor car travel, everything considered. This road has the best crossings over the Red river at Randlett and the South Canadian river at El Reno. From Oklahoma City this route will take you through Yukon, El Reno, Minco, Pocasset, Chickasha, Verden, Anadarko, Apache, Pawton, Emerson, Randlett, Burkburnett, Wichita Falls, Jacksboro, Weatherford, Annetta, Aledo, Ben Brook and Ft. Worth. The Ft. Worth-Dallas stretch is through Handley, Arlington and Grand Prairie.

The dotted line is the more direct route between Chickasha and Ft. Worth, but there is a stretch of sand between Bowie and Decatur which a motorist never wishes to tackle the second time. There is no bridge at Terrel and a ferry has to be engaged.

It is 27 miles over a fast road from Oklahoma City to El Reno; to Chickasha it is 43 miles; crossing to the bridge south of Randlett is 101 miles; Burkburnett to Ft. Worth is about 135 miles; Ft. Worth to Dallas is 33 miles.

IOWA, DAKOTAS, PACIFIC COAST

Newton, Ia.—Editor Motor Age—I would like a route from Newton, Ia., to Estelline, S. D., thence to Webster and Selby, S. D., then to the western coast via Omaha, Neb.—Charles Iske.

Wending your way in a northwesterly direction for the Dakotas, the most direct route would be to go to Iowa Falls through Laurel, Marshalltown, Albion, Union, Gifford, Eldora, Iowa Falls, then going west to Le Mars over the Hawkeye highway through Alden, Wilkie, Williams, Blairsburg, Webster City, Fort Dodge, Barnum, Manson, Pomeroy, Fonda, Newell, Sulphur Springs, Storm Lake, Alta, Aurelia, Cherokee, Marcus, Remsen, Le Mars. From Le Mars to Sioux Falls, S. D., go through Sioux Center, Perkins, Doon,

Rock Rapids, Lester, Larchwood, Sioux Falls.

Leaving Sioux Falls for Estelline, Webster and Selby, go through Dell Rapids, Flandreau, Brookings, Estelline, Castlewood, Watertown, Webster, Bristol, Andover, James, Aberdeen, Ipswich, Roscoe, Gretna, Alamo, Selby.

Return to Le Mars and route to Omaha via Merrill, Hinton, James, Sioux City, Salix, Sloan, Whiting, Onawa, River Sioux, Missouri Valley, Crescent, Council Bluffs, Omaha.

No specific city on the Pacific coast being designated by you, Motor Age is taking San Francisco as your destination, and from Omaha cross Nebraska through Elkhorn, Waterloo, Valley, Freemont, Ames, Schuyler, Benton, Columbus, Duncan, Silver Creek, Havens, Central City, Chapman, Grand Island, Alda, Shelton, Buda, Kearney, Odessa, Overton, Lexington, Gothenburg, North Platte, Sutherland, Paxton, Ogallala, Chappell, Sidney and Kimball. Then cross Wyoming via Pine Bluff, Egbert, Cheyenne, Granite, Buford, Red Butte, Laramie, Rock River, Medicine Bow, Fort Steele, Rawlins, Wamsutter, Tipton, Bitter Creek, Rock Springs, Cumberland and Evanston.

Utah is crossed through Echo, Ogden, Brigham City, Corinne, Tremonton, Snowville, Curley, Kelton. From Kelton keep to the north of the railroad and avoid Terrace; then through Lucin and Montello. This detour out of Kelton is suggested because of present road conditions, and it might be well to make inquiries at Brigham City and Kelton. From Montello continue over the transcontinental road through Nevada via Cobre, Wells, Elko, Palisade, Battle Mountain, Winnermucca, Lovelocks, Fresno, Reno; then crossing the state line into California and going through Hobart Mills, Truckie and Auburn, into Sacramento, then through Stockton into San Francisco.

FLORIDA TO INDIANA

Cicero, Ind.—Editor Motor Age—Kindly give me a route from St. Petersburg, Fla., to Indianapolis, Ind.—George Arduser.

Taking Tampa as the starting point and with Jacksonville, Fla., the first objective point, go over the main-traveled coast route through Mango, Seffber, Dover, Plant City, Lakeland, Bartow, Eagle Lake, Haines City, Loughman, Campbell, Kissimee, Pine Castle, Orlando, Maitland, Longwood, Sanford, Osteen, Enterprise, Orange, Daytona, Ormond, Moultrie, St. Augustine, Jacksonville. If you do not care to take the coast route to Jacksonville, then you might go to Tarpon Springs from St. Petersburg, going through Largo, Dunedin, Ozona; thence to Brooksville, Irverness, Dunnellon, Ocala, McIntosh, Evanston, Gainesville, Fairbanks, Waldo, Hampton, Starke, Lawtey, Highland, Jacksonville.

Up to the present the greater portion of the travel has been over the eastern route to Savannah, thence to Atlanta, the route being through Callahan, Kings Ferry, Owens Ferry, Tarboro, Brookman, Old Sterling, Brunswick, Dents Landing, Darien, Riceboro, Freedman's Grove, Savannah. On this stretch of the route you will have to resort to ferrage at Kings Ferry, Owens Ferry, and Darien-Dents. Savannah to Atlanta passes through Ivanhoe, Statesboro, Rocky Ford, Scarboro, Perkins, Waynesboro, Louisville, Sandersville, Milledgeville, Macon, Loraine, Forsythe, Barnesville, Griffin, Hampton, Orr's Station, Jonesboro, Atlanta.

Looking at the map one would suppose the inland route from Atlanta to Indianapolis, which is practically in the direction "the crow flies," would be the most feasible and more easily negotiable, but this route even at its best is fraught with difficulties and certainly will ruffle the best of tempers. Motor Age has often outlined this route, through Chattanooga, Nashville and Louisville when requested, but if one's time is not limited would suggest the longer and eastern route via Wheeling, W. Va. Many times the longer route proves the shorter, due consideration being given to the actual road conditions, accommodations, etc. There is plenty of mountain climbing on either route, and long bad stretches, too. However, we are outlining the eastern route, but should you be adverse to taking it Motor Age will gladly give you at any time the itinerary of the "crow" route. Atlanta to Greenville, S. C., 188.6 miles, is through Decatur, Ingleside, Clarkson, Snellville, Auburn, Winder, Commerce, Royston, Canon, Lavonia, Anderson, Piedmont, Greenville. Greenville-Charlotte, N. C., 116 miles via Greer, Duncan, Spartenburg, Converse, Blacksburg, Grover, Bessemer City, Lowell, Belmont, Charlotte. Charlotte to Winston-Salem, 135.2 miles, passes through Newell, Concord, Kanapolis, Salisbury, Spencer, Lexington, Thomasville, High Point, Jamestown, Greensboro, Summerford, Centerville, Winston-Salem, thence 123.6 miles to Roanoke through Kernersville, Stokesboro, Ellisboro, Madison, Ridgeway, Martinsville, Oak Level, Rocky Mount, Roanoke. Approximately 90 miles to Staunton go via Cloverdale, Troutville, Buchanan, Natural Bridge, Lexington, Fairfield, Midway, Breenville, Minte Springs, Staunton.

Going 135 miles the route from Staunton to Hagerstown, Md., lies through Burkstown, Mount Crawford, Harrisonburg, Lacey Springs, New Market, Mount Jackson, Woodstock, Maurertown, Strassburg, Middletown, Winchester, Va., Martinsburg, W. Va., Williamsport, Md., Hagerstown, Md.

Going west from Hagerstown to Indianapolis the route is: Clear Springs, Hancock, Gilpin, Cumberland, Frostburg, Grantsville, Somerfield, Keyser, Addison, Uniontown, Broonsville, Beallsville, Washington, Pa., Wheeling, Bridgeport, St. Clairsville, Morristown, Hendricksburg, Elizabethtown, Cambridge, New Concord, Norwich, Zanesville, Hopewell, Brownsville, Hebron, Etna, Reynoldsville, Columbus, Dayton, Eaton, Westville, Richmond, Centerville, Cambridge City, Lewisville, Knightstown, Greenfield, Indianapolis. Blue Books, volumes 3 and 4, contain complete running directions of this entire route. If you will refer to your Motor Age March 28, 1912, page 16, you will find a map showing the two routes from Jacksonville to Indianapolis.

BEST ROUTE THROUGH OKLAHOMA TO FORT WORTH, TEXAS

Floods in Southern Indiana Affect Roads

INFORMATION obtained from the Evansville Automobile Club, Evansville, Ind., is to the effect that the road leading to Vincennes, Ind., is in very bad condition. There is no bridge at the White river and the country on both sides of the river is low, consequently flooded. It will cause traffic to be impeded for several months. The first 27 miles is clay and sand road; the remaining 23 is gravel. The road to Rockport is in an impassable condition and is likely to remain so a month or so even should the weather be good.

The Kansas City Automobile Club, Kansas City, Mo., reports that they have been quite fortunate in regard to floods this spring and have managed to escape serious trouble. No bridges have been reported washed out, and outside of the soft condition of the roads, due to the usual spring thaws, all roads are open and conditions are improving every week.

Wiring of Dual System

Connections of High-Tension Magneto With Battery and Separate Coil

CHICAGO—Editor Motor Age—Illustrate with a wiring diagram the proper method of wiring a high-tension magneto on a four-cylinder motor with one set of spark plugs, battery and separate coil.—A. Reader.

The wiring diagram of a Bosch high-tension magneto with battery and coil is shown in Fig 2. This dual system requires four connections between the magneto and the switch; two of these are high-tension, and consist of wire No. 3, by which the high-tension current from the magneto is led to the switch contact, and wire No. 4, by which the high-tension current from either magneto or battery goes to the distributor. Wire No. 1 is low-tension, and conducts the battery current from the primary winding of the coil to the primary timer. Low-tension wire No. 2 is the short-circuiting wire by which the primary circuit of the magneto is grounded when the switch is thrown to the off or to the battery position. Wire No. 5 leads from the negative terminal of the battery to the coil, and the positive terminal of the battery is grounded by wire No. 7; a second ground wire No. 6 is connected to the coil terminal.

HAS CLUTCH TROUBLE

Springfield, Ky.—Editor Motor Age—I have a model T Ford and cannot throw the clutch into the neutral point. I have tried adjusting the set screw in the pedal connection, also the threaded pedal connection, but to no purpose. When the rear wheels are jacked up and the engine run, the rear wheels will turn no matter in what position the pedal is. The car has been run about 2,700 miles and I have had this trouble since I first got the machine. If one of the clutch fingers, or rather if one of the adjusting screws in the clutch fingers, were screwed in a little farther than the other two, would this cause the trouble?—A Reader.

Your trouble evidently is due to excessive end play in the drive shaft of the transmission, between the disk drum and the brake plate; it might be due to the use of too heavy a grade of oil, however, in which case the use of a lighter grade might eliminate the trouble.

EXPORTATION OF AMERICAN CARS

Aberdeen, S. D.—Editor Motor Age—What per cent of American-made motor cars is exported and to what countries proportionately?

2—What is the tariff on foreign-made cars into this country?—R. A. Romans.

1—Approximately 7½ per cent of motor cars manufactured in 1911 in America was exported. Figures from the department of commerce show that of the 15,000 motor cars exported in 1911, 4,021 went to the United Kingdom, 4,987 to Canada; 2,476 to British Oceana; 1,116 to South America; 420 to France; 115 to Germany; 176 to Italy; and 795 to other portions of Europe.

2—Tariff on foreign made motor cars received into this country is 45 per cent ad valorem.

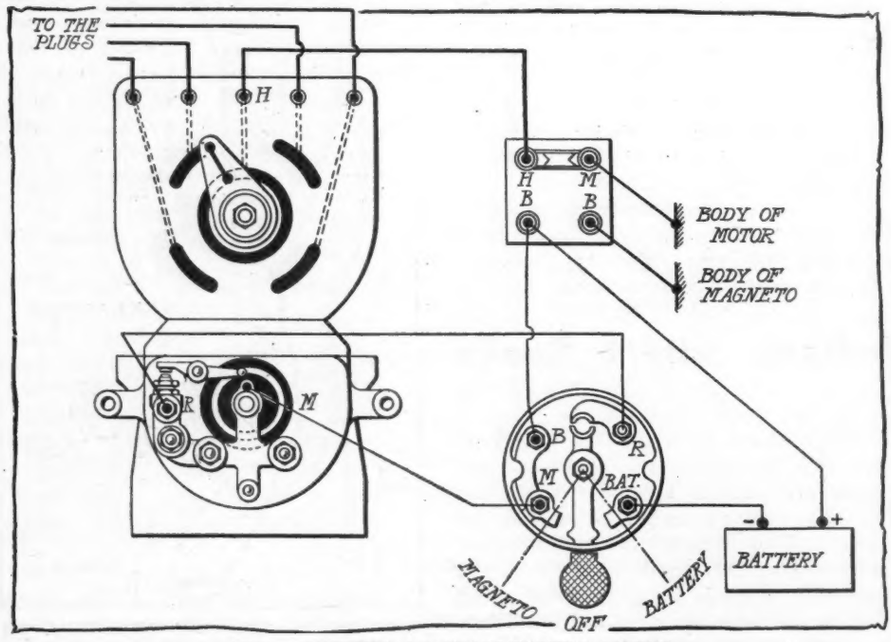


FIG. 1—WIRING OF CRAIG-TOLEDO MOTOR

The Readers'

Excessive End Play in Drive Shaft Responsible for Clutch Trouble—Exports of American Cars—Bosch Dual System Explained

Cause of Motor Racing

Early Spark Usual Reason For Wild Running Without Load —Retime Magneto

LOUP CITY, Neb.—Editor Motor Age—I have a Velie 30 with a Mayer carbureter which came with the car. The carbureter is in good repair, and a new auxiliary air valve has been put into it making it as good as new so far as repair goes. I can run as slowly as I like when running on the batteries, and can also run slowly when I use the magneto, provided the engine is pulling a fair load, such as pulling through a sandy place or the like. When the engine is running wild on the batteries it will throttle down well, but as soon as I let it run wild on the magneto it will not throttle at all and runs a great deal too fast even if throttled down as far as possible. Would it help me to put an air valve in the intake and make different carbureter adjustments? Is it possible that the magneto is advanced too far, and how can I remedy the trouble in that case?—A. F. Elsner.

It often happens that when a motor is throttled down and running wild as you say, that is, without load, the force of the explosions will make the motor operate so fast that it will choke itself, so to speak; the speed will cause the motor to require more fuel than the closed throttle will permit to pass; the result is that the motor will misfire or perhaps cough and sputter for a few seconds until it has slowed down sufficiently to operate regularly again on the limited fuel supply.

Often a single explosion, or two or three explosions in succession will increase the speed of the motor to such an extent, that a vacuum is created in the inlet pipe of the motor, and when the inlet valve of the next cylinder to fire is opened, the piston in the cylinder may have descended more than half the length of its stroke before the vacuum in the cylinder is greater than that of the inlet manifold; so that instead of getting a normally full charge of fuel mixture, perhaps not even a half charge is drawn into the cylinder. Hence a misfire occurs. It is reasonable, therefore, to believe that if the magneto is retimed so that a greater degree of retard can be obtained, the motor will not run so fast without load, and the misfiring will thus be eliminated. This may result in a slight increase in power.

Clearing House

Unequal Light from Lamps in Series Due to Short Between Them—Ignition Wiring of Old Motor—Nickle-Plating Brass—How to Enamel Lamps

Electric Lighting Query

When Lamps Connected in Series Do Not Give Equal Illumination Look For Short-Circuit

ORDWAY, COLO.—Editor Motor Age—I have two electric headlights on my Ford car, the current being taken from the magneto. The bulbs are 8 candlepower wired in series. The wire is grounded on the left-hand lamp bracket. The left-hand bulb always gives the strong light. I have interchanged bulbs from one side to the other, and vice versa, but the left-hand globe always glows the brighter. What is this?

2—What is the best method as to cleaning reflectors to prevent scratching them? —Electric

1—There evidently is a partial short-circuit around the right-hand lamp; that is, a by-path or shunt circuit is provided through which part of the current flows without passing through the lamp filament. It may be due to a faulty right-hand socket, or to slight contact between the wires connected to the right-hand socket. Perhaps one or two stray strands of the wire connections in the socket are causing a slight shunt circuit which diverts part of the current that should pass through the lamp filament.

2—If the reflectors are readily removable, take them out of the lamps and rinse the dust off of them with hot water, then dry thoroughly with a soft cotton flannel cloth. The object is to remove the dust without wiping it off, for the wiping tends to scratch the surface. If the reflectors are not readily removable, try removing the dust by blowing it off, or by flicking it off with a cloth; after which the soft flannel cloth can be used to brighten up the surface. Most grocers and jewelers furnish a polishing powder which can be used with safety on a highly polish reflector surface in case it is tarnished.

NICKEL-PLATING BRASS

Newton, Ill.—Editor Motor Age—Will Motor Age tell me how I can change the brass on my car to enamel, nickel, or silver appearance? Also give me address of firms which have preparations for sale for doing this work.—H. O. Smith.

The method of enameling brass parts was described in the answer to H. H. Frudenfeld, Madison, S. D., whose inquiry appears in this issue. To get a nickel surface on brass it is necessary to actually deposit the nickel in an electric bath. Many people have an idea that nickel-plating consists of simply dipping the parts into a tank containing a nickel solution. This idea, of course, is erroneous. If you took the part and dipped it into the tank you would secure no better results than if you dipped it in a pail of water.

Nickel-plating is done by a process of electrolysis. The tank is filled with nickel salts and water. Nickel anodes are hung on the side of the tank, suspended from a brass tube to form a connection with an electric current, which passes from the nickel anodes through the article which is to be plated. The part to be plated is also suspended from the brass tube. The anodes constitute the positive pole and the part to be plated constitutes the negative pole. The electric current travels from the positive pole to the negative pole, depositing the nickel as it passes through the part to be plated. Any plating firm can nickel-plate the brass parts.

Some of the plating firms in Chicago are: Alex T. Bagley Co., Art Plating Co., C. A. Barnes & Sons, Neuman Norbert & Co., Co-operative Plating Works, and American Toy and Mfg. Co.

CRAIG-TOLEDO WIRING DIAGRAM

St. Paul, Minn.—Editor Motor Age—Please print a wiring diagram of the ignition system used on the 1907 Craig-Toledo roadster equipped with an Eisemann dual magneto.—A Subscriber.

A diagram of the Eisemann dual ignition system used on the Craig-Toledo car is shown in Fig. 1.

Enameling Brass Parts

Process of Applying Popular Finish on Metal Trimming of Car—Preservation of Signposts

MADISON, S. D.—Editor Motor Age—What is the best method of preserving signposts so they will not rot below or above ground?

2—What process can I employ in a small way to bake enamel on brass parts, such as grease cups, etc., and what materials are needed?—H. H. Frudenfeld.

1—Apply some of the wood preservative compounds such as creosote to the part to go in the ground. Paint the upper part.

2—In the first place, an oven must be provided in which to bake the enamel on these small parts, such as lamps, windshield rails, grab handles and other attachments. Probably an oven anywhere from 4 feet to 6 feet square, or in any shape, but containing about the number of square feet which these 4 or 6-feet ones do, will answer the purpose for many of our readers who simply wish to take up the enameling work on a small scale and handle only small parts. Previous to enameling the brass should be put through a process of preparation that will not only remove all the dirt and grease, but all the old lacquer. Enamel cannot be safely baked on a surface carrying a glaze of lacquer applied when the brass parts were polished and made ready for service, and since which time it has become almost as hard as the metal itself.

Where the cleaning and enameling is to be done on a considerable scale nitric and sulphuric acid dips may be provided, these being the quickest and most thorough methods of removing the old lacquer, but this system is rather expensive to install and maintain. As an efficient substitute, make a dip of water and caustic soda in the proportions of 5 pounds of caustic soda to 20 gallons of water. This caustic soda bath, while removing the lacquer, does not remove the tarnish, so that in case the lacquer is being taken off for the purpose of repolishing and lacquering it is

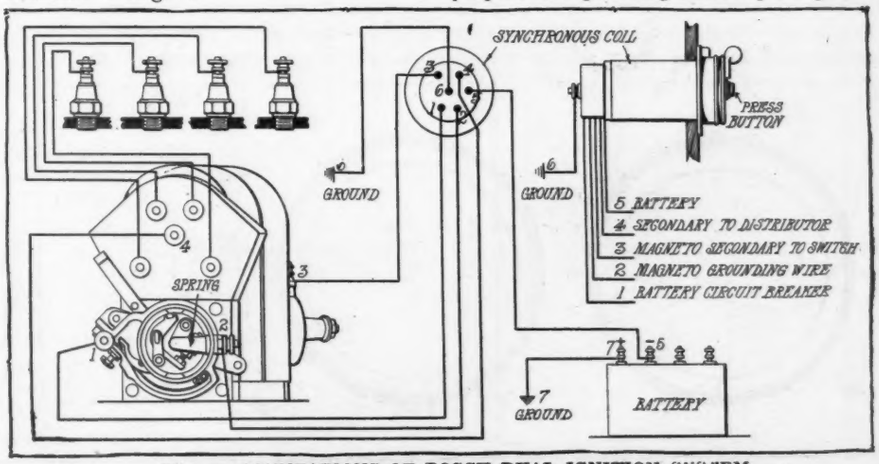


FIG. 2—CONNECTIONS OF BOSCH DUAL IGNITION SYSTEM

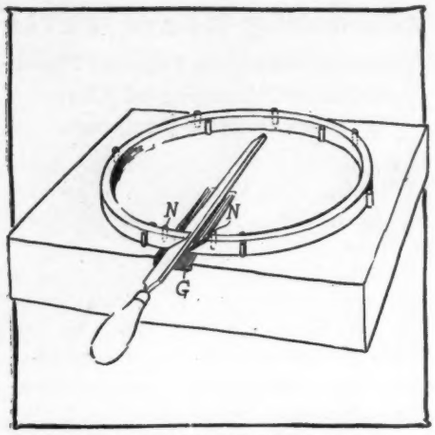


FIG. 3—TRIMMING DOWN SLOT

essential that the brass be given a second immersion, this time in a dip of oxalic acid and water, the proportions of which are ¼ pound of oxalic acid and 20 gallons of water. To make the practice plain first give the brass a thorough bath in the caustic soda solution, then remove it to the oxalic acid solution, after which remove, wipe dry and polish with some approved metal polish. Having stripped the lacquer off by means of the caustic soda solution, it is next a good plan to slightly roughen the surface with No. ½ sandpaper, at the conclusion of which work it is ready for the baking enamel.

For lamps, windshields and parts of this class apply as a first coating metal primer or a primer shop-mixed and called by the same name. The ready-to-use metal primer, if secured from a standard color house, usually is reliable, and, on the whole, cheaper than the shop-made material. Make primer consist of equal parts of raw linseed oil and turpentine stained with enough white lead to give the mixture a baking body. Apply to the surface with a camel's hair brush. Heat the oven to 200 degrees Fahrenheit, and bake the primer for 3 hours at this temperature. If the parts are to be finished in black next apply two coats of black enamel, baking each coat 6 hours at 180 degrees.

All these parts may, of course, be finished in any desired color, the firms making enamels supplying them in a wide variety of colors and shades. Then with No. ½ sandpaper slick the surfaces down smooth and fine and apply a coat of the desired enamel. In this connection it is well to understand that colored enamels other than black, require less heat to bake them than the black. The black should be baked for from 5 to 6 hours at 200 degrees.

Most of the blue enamels bake at 125 degrees, whereas the greens require 140 degrees and even more. Baking white enamels at a temperature higher than 100 or 110 degrees is likely to throw a dirty yellow shade into the white. Gray enamels, such as are used quite extensively at the present time may be baked at from 120 to 140 degrees without affecting the quality of the color. Brown enamels are baked at from 130 to 175 degrees. Yellows should not be baked at more than 125, and a lesser heat is more to be preferred. If more than one coat of

Increasing Cylinder Compression

Proper Fitting of Piston Rings Requires Careful Manipulation —Comparatively Simple If Process Is Known

ST. CHARLES, Ia.—Editor Motor Age—I would like to know how to put in new piston rings and to grind them in so the cylinders will have good compression —X. Y. Z.

Like all mechanical operations the fitting of piston rings is comparatively simple—if you know how; but in the hands of the novice many rings are sprung and some are broken. Most manufacturers now cut the grooves in the pistons of their motors and grind the face and edges of the rings to a gauge, making very little hand fitting necessary, but there are cases, and these are the ones that generally come into the repair shop, where the cut was just a trifle larger or the ring a little smaller than the gauge, making it essential that each ring be individually fitted to the groove in which it subsequently is to rest.

To properly dress down a ring requires some skill, and a good mechanic will select a ring which will demand the least amount of fitting, for it is a delicate operation. After having selected a set of rings, the first operation is to fit them into the cylinder.

Taking one ring at a time, try very carefully to shove it straight in, concentric with the cylinder walls; if the ring is of the diagonal-slot type and its diameter a little large, the ends will run up on each other, throwing the edges out of line; whilst if a ring with square cut overlapping ends is used it will not go in at all. Therefore, the ends must be trimmed off so that when the ring is well up in the cylinder there will be a space of from 8 to 15-1000 of an inch between the ends, to allow for expansion caused by the heat of the motor.

The groove G on the block shown in Fig. 3 is used in reducing the size of the diameter of diagonally-slotted rings. A thin smooth flat file is best used for this purpose and it should be placed between the ends of the ring with its bottom edge in the groove G. The ring then must be pressed together so that its ends bear against the surfaces of the file as it is moved forward. The ring should be repeatedly tried in the cylinder in order that the space is not filed to exceed the above dimensions. The inside portion of the rings near the ends should rest against the nail ends, in order that they may not be broken off when filing the slot.

Having attained the proper space between the ends of the ring, while in the cylinder place a light in the cylinder behind it, and see how its face conforms with the wall of the cylinder. If there is good contact all around, the ring is ready to be fitted on to the piston; but if the contact is poor, leaving space between the cylinder wall and the ring as at C and P Fig. 4, either the ring or the cylinder is out of round. If the fault lies in the ring the face can probably be dressed down to fit, or another ring selected; but if the cylinder is badly out of round it will have to be rebored or reground or both as the case may be or replaced with a new cylinder. This of course would necessitate the fitting of new pistons and the same treatment being required in all cylinders to maintain the balance of the motor.

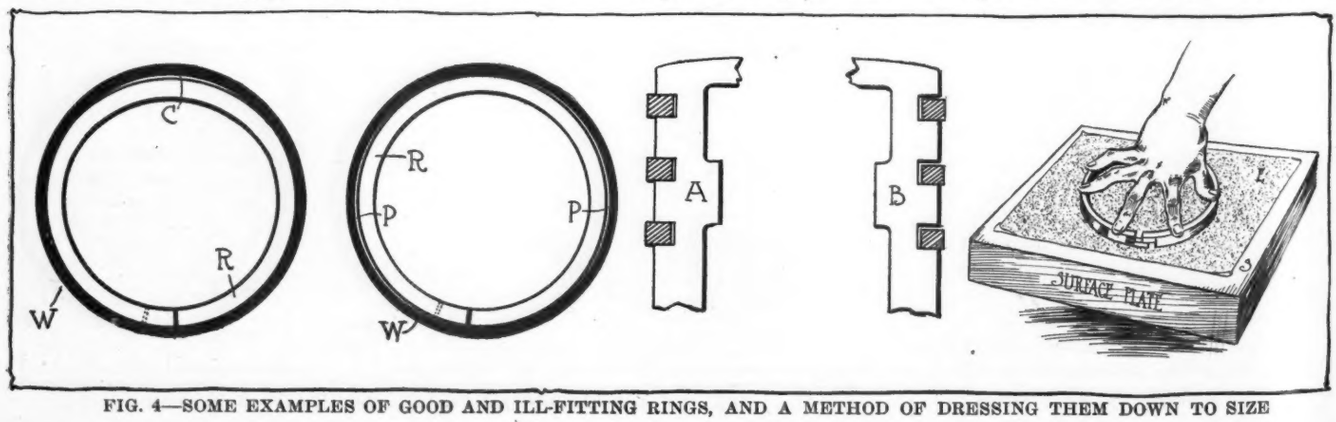


FIG. 4—SOME EXAMPLES OF GOOD AND ILL-FITTING RINGS, AND A METHOD OF DRESSING THEM DOWN TO SIZE

Method of Fitting Rings Is Described

Scheme Illustrated for Iowan—A Simple Home-made Filing Block—The Definition of Cycle

When the rings have been adapted to the cylinder the next operation is to fit them in their respective grooves on the piston. Begin with the ring selected for the bottom groove. First, try the ring without slipping it over the piston, by inserting it in the groove and rolling around its circumference, as indicated in Fig. 6. It should fit snugly as at A, Fig. 4, but still is should be free to slide in and out easily; if it binds at any place, apply a thin film of red or black lead or prussian blue in the same manner as employed in scrapping bearings, to locate the high places; then dress down the high places with a thick, smooth, flat file, and again try it in the groove. When filing is necessary it should be confined to one edge only in order that at least one good edge is retained, for it is almost impossible to secure as regular a surface with a file as that made by a grinding machine. An example of ill-fitting rings is shown at B, Fig. 4; and at the left of this illustration the space C shows a ring that was sprung in putting it on the piston. This might have been done by using strips, Fig. 5, that were too thick.

A very simple and effective means of holding a ring for fitting is shown in Fig. 3; the ring is placed on a block of wood and a few small nails are driven into the block both inside and outside of the ring in such a manner that the ring is held securely in place for filing. The heads of the nails are then cut off, the ring removed and the nails filed down so that they will extend just below the top surface of the ring when it is placed on the block. With the nails well placed there is comparatively little danger of breaking the ring during the filing operation. Another simple and effective method of dressing down the ring to fit a groove is shown in Fig. 4. A piece of crocus cloth is laid upon a surface plate or some such flat surface then the ring is carefully rubbed around on it in the manner indicated in the illustration.

Having fitted one ring, put it in place immediately and repeat the operation for the next ring. A method of slipping rings into their grooves is shown in Fig. 5. Take three strips of sheet metal, brass or tin for instance, about 1-32 inch thick and ½ inch wide and 5 inches long; bend these at right angles and hang them on the edge of the piston at equal distances apart. The ring then may be slipped over these till it is opposite its groove, when the strips may be removed and the ring allowed to slide into place. The same strips also may be successfully used in removing rings. The experienced repairman generally uses a tool resembling a pair of pliers by means of which he expands the ring sufficiently to slip it on or off the piston, but in the absence of this tool he generally prefers to use his fingers only in removing a ring, as there is a tendency to expand the ring too much and spring it out of shape by using the strips as above mentioned. It is advisable therefore, to simply expand the ring by taking hold of it as shown in Fig. 7 and removing it carefully by lifting it over the spacers between each groove. Emery cloth should not be used in this work.

FIG. 5—REMOVING A PISTON RING

any of the enamels are applied rub the last coat of enamel with pumice stone flour and water and finish, in the case of good work, with two coats of varnish, baking each coat at 150 degrees for 5 hours.

MEANING OF CYCLE

Waukomis, Okla.—Editor Motor Age—How many revolutions per minute will the Overland model 59 motor make?

2—Will there be a grand prize race in 1912?

3—About how many horsepower would a two-cylinder motor with a 10-inch bore and 12-inch stroke develop?

4—What is meant by the cycle of a gas engine?

5—What are the specifications of the 20-horsepower American roadster?

6—Is there any other horsepower rating besides the S. A. E.? If so, what is it?

7—Will a motor with a 4¾-inch bore by 5½-inch stroke develop 50-horsepower?—Shorty.

1—The normal speed of revolution of the motor in the Overland model 59 is 900 revolutions per minute.

2—The grand prize race will take place near Milwaukee, Wis., probably in September, although official sanction has not been given nor has the date been definitely set.

3—According to the S. A. E. formula, a two-cylinder motor with 10-inch bore will develop 80 horsepower at a piston speed of 1000 feet per minute.

4—By the cycle of a gas engine is meant that series of events by which the fuel is drawn in, compressed, exploded and exhausted to produce the power stroke. The events in each cycle in their order are admission, compression, explosion and exhaust. Gasoline engines are divided into two classes according to the number of strokes of the pistons that are necessary to accomplish the cycle; in the usual type, four strokes are necessary, this class being called the four-stroke cycle or four-cycle type in distinction to the two-stroke cycle or two-cycle type in which but two strokes are required.

5—The main specifications of the American 20 are four cylinders, 3¾ bore, 4½ stroke, 22.5 S. A. E. horsepower, L-head cylinders cast in one block, cellular radiator, Bosch magneto, Schebler carbureter, 105-inch wheelbase, 36 by 3½-inch tires, half-elliptic springs front and rear, cone clutch, three-speed selective gearset, which is unit with the motor, floating rear axle with internal service and emergency brakes. More detailed specifications can be obtained from the table of specifications of 1912 pleasure cars published in Motor Age, January 4.

6—There is no generally accepted horsepower rating besides the S. A. E.

7—The number of cylinders and speed of revolution will be factors in deciding

FIG. 6—TRYING RING IN GROOVE

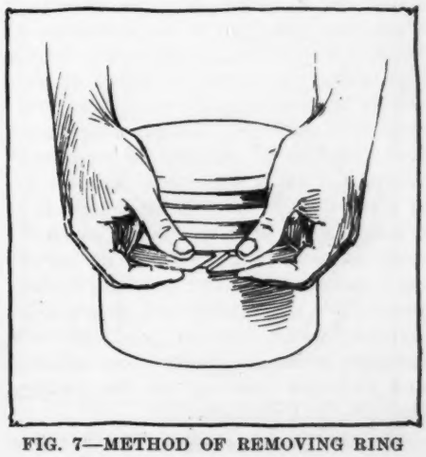


FIG. 7—METHOD OF REMOVING RING

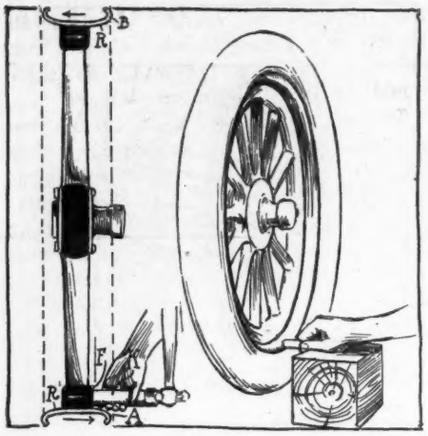


FIG. 8—TRUING UP WHEEL

How to Straighten Front Wheels

Getting Ready for Summer—Taking Up Play in Steering Gear—Car-Body Polish Suggested

BENSON, Minn.—Editor Motor Age—Please advise and illustrate how I should take up the play in the steering gear of a model 42 New Parry.

2—Illustrate a method for straightening a sprung front wheel.

3—Can I prevent gasoline from running out of leaky connections by applying shellac?

4—Could Motor Age give me a receipt for a good body polish?

5—Does the use of water containing a percentage of iron damage the circulation system?—Carl O. Uhl.

1—In order to take up lost motion in the steering gear of your car, it first will be necessary to locate it. If the lost motion is in the steering connections, the joints of the steering rods at the knuckles and steering arms, etc., it may be necessary to fit new pins and rebush the holes in the connections. It also is possible that adjustment of the thrust bearings of the steering worm is necessary; an adjusting nut generally is provided for this purpose at the lower end of the steering column just above the worm-gear case. Be careful in making this adjustment, for if tightened too much the steering wheel will be hard to operate with but little benefit in the removal of the lost motion. This adjustment generally has two nuts, the top one being simply a locknut. The locknut should be loosened first, then the other nut tightened carefully until the steering wheel just begins to operate harder than usual, then it should be loosened again just about half a turn, and the locknut tightened. See that there is no lost motion in the steering arm itself, this is dangerous.

2—A method of straightening a sprung front wheel is shown in Fig. 8. The wheel is jacked up and a block is placed beside it to steady the hand which holds a piece of chalk close beside it. As the wheel is revolved slowly the distance between the rim and the end of the chalk is noted. If it remains the same throughout the revolution of the wheel the wheel is true; but if it varies, the wheel is untrue and by holding the chalk a trifle closer a mark will be made on the rim of the wheel at the point where it touches the chalk. If a wheel is not more than a quarter of an inch out of true it generally can be trued up very easily with a block of wood and a hammer. This, however, is

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the horsepower of the motor to which you refer. A four-cylinder motor of 4¾ bore will develop 36.1 horsepower and a six-cylinder motor will develop 54.1 horsepower at 1000 feet per minute piston speed according to the S. A. E. formula. speed according to the S. A. E. formula. It is probable that the actual horsepower developed will be somewhat in excess of this.

LENGTH OF STROKE IN QUESTION

Rio Vista, Cal.—Editor Motor Age—Is there a different horsepower rating for motor car and traction engines, that is, does an 80-horsepower traction engine have more power than an 80-horsepower motor car?

2—Has Motor Age any information on the L. C. Best traction engine manufactured at Elmhurst, Cal.?

3—What is the advantage of long-stroke over short-stroke engines?—Lon Malloy.

1—No; there is no different horsepower rating for motor car or traction engines. Eighty horsepower is 80 horsepower regardless of the type of engine that developed it.

2—No; Motor Age has no information regarding the above mentioned traction engine and would advise that you communicate with the factory direct.

3—A saving in weight and ability to obtain higher speed are two of the characteristics which make the short-stroke motor better suited to some phases of motor car work. As to the advantage of the long-stroke from a standpoint of general economy and wearing qualities, there can be no question, but the short-stroke motor has decidedly the advantage when the question of weight is considered. Whether or not a long-stroke motor or one of a short stroke is preferable, depends to a great extent upon the use to which the motor is to be put. In motor car service the long-stroke motor is particularly adapted for commercial cars, on which its increased weight and size is of little consequence while its greater fuel economy and increased lease of life are features that are much discussed.

The short-stroke motor for the same power output must run at higher speed of revolution. The inertia forces of a motor are proportional at equal piston speed to the number of revolutions. These forces and the strains and vibrations which they entail therefor are greater in the short-stroke motor than in the long-stroke. The compression chamber of a long-stroke motor is comparatively more compact than in a short-stroke motor, thus assuring a slightly greater thermal efficiency for the former, and, turning at a lower speed of revolution, it is easier to secure in the long-stroke motor a quiet operation of the various features such as the valves, magneto and pump.

MAGNETO MISSES ON LOW

Aurora, Iowa—Editor Motor Age—What will cause a motor to miss running on the magneto when it will fire regularly on the batteries? The motor is in good condition except wires are somewhat oil soaked. The motor is an Oswald with Remy magneto. It does not miss on any particular cylinder, and always runs better with the spark well advanced—F. T. Scharff.

Possibly the points of the spark plugs are too far apart for the current supplied by the magneto at low speed. The terminals should be not over 1/64-inch apart. It also is possible that there is sufficient leakage through the high-tension wires to make the spark absent or too weak on low speeds. Try new cables. If neither of these is the cause, it is probable that the magnets of the magneto are weak and need recharging.

ELIMINATING BODY SQUEAKS

Mt. Carmel, Ill.—Editor Motor Age—How can I make my brake on my Buick 31 take hold better? It is an expanding brake. I have taken up the rod that runs from the pedals to the drum and keep all grease out, and put on new lining.

2—I have no compression. I have cleaned all carbon out of the cylinders, and rings are in perfect shape; ground all valves, but still have no compression.

3—How can one tell if the cylinders are scored? If scored, can they be fixed?

4—I have a Splitdorf magneto. I cannot run slow on it. When I run it as slow as 15 miles an hour it misses. Is there any way a magneto can be fixed so as to run very slow?

5—What is the speed of a 21 Buick?

6—How can I get on the mailing list of different houses?

7—How can one find a body squeak?

8—How can I make my car more quiet?—Herbert Walter.

1—Providing your wheel bearings are properly adjusted and the brake bands arranged so that they will bear on the entire drum, Motor Age knows of no reason why your brakes should not hold unless the brake rods themselves are not properly adjusted. Perhaps the brake lever is bearing against some part of the

Pointers in Spring Overhauling

Shellac Only a Temporary Repair for Leaky Gasoline Line —Locating and Remedying a Body Squeak

possible only when the fault is due to the rim having been moved on the felloe.

If the rim itself is bent, which is not often the case, it will have to be removed from the felloe, heated, and then pounded back into shape when red hot, or a new rim fitted. The most simple method of truing up a wheel is shown at the left in Fig. 8. In this case it was found in testing the trueness of the wheel that at the point A, the distance between the end of the chalk and the rim was about ¼ inch and at the point B it touched the end of the chalk and a mark was made. By taking a block of wood, holding it against the felloe F just opposite the point A and striking a single sharp light blow with a hammer, as indicated, the rim R moved just the required distance in the direction of the arrow and assumed its original true position. Of course it is not always possible to get a wheel true with a single blow of the hammer, but the method, nevertheless is very effective and easy to perform.

3—Shellac properly applied to the gasoline line will provide a temporary repair for a leaky connection, but a good job of soldering is the only permanent repair and under ordinary circumstances it is almost as quick.

4—A body polish which has given good results in some cases can be prepared by dissolving 5 parts by weights each of shellac, and sandarac in 77 parts by weight of 95 per cent alcohol, filtering, and adding 8 parts by weight of mineral oil and 8 parts of Spanish white. This is a French polish and must be rubbed in. For renewing the polish or repolishing use 4 parts of shellac, 32 parts of alcohol, 16 parts oil of turpentine, 32 parts boiled linseed oil and 4 parts of ammonia water. Dissolve the shellac in the alcohol then dissolve in a separate vessel the linseed oil and the turpentine, adding them slowly and stirring all the time; then add the ammonia water and stir thoroughly.

5—Unless the proportion of iron in the water is very great, little damage occurs from its presence in the circulation system. If the per cent of iron is large it may be deposited on the cooling surfaces, if used continually, and form a coating which would cause the motor to heat up. More trouble is to be apprehended from other impurities than iron in the water, such as lime, etc.

mechanism which prevents the pressure being applied to the brake bands.

2—It is possible that your valve push-rods require adjustment. They may be keeping the valves from closing tightly. At least 1/64 to 1/32-inch of space should be allowed between the end of the valve stem and its operating mechanism when the valve is closed.

3—You can learn if the cylinders are scored either by dropping the lower portion of the crankcase and looking up into them, or removing the valve cages and looking into the cylinders through the valve-cage openings. The only way to fix them would be to have the cylinders rebored and new pistons fitted; or get a new set of cylinders.

4—It is quite possible that the points on your spark plugs are too far apart for slow-speed work and it would be advisable to adjust the space 1/64-inch on each plug. If this does not remedy the trouble, send the magneto to the Splitdorf agency in Chicago with an explanation of your trouble and have it properly overhauled and adjusted. This will not be expensive and will probably be cheapest in the end.

5—A speed of 60 miles an hour is claimed for the Buick in good condition and under ordinary circumstances.

6—A classified advertisement in Motor Age will accomplish this.

7—It is difficult to advise how to find a body squeak. It may be due to the tonneau door edges fitting too closely at the top or bottom and rubbing against the pillars, or the front ends of the body may be rubbing against the dash, or the body bolts may be loose and the body portion rub against the frame. It sometimes happens that the frame sags a little after long service and perhaps from overloading the car, and this brings the upper edges of the doors into rubbing contact with the pillars of the body and gives rise to squeaks. The remedy is to place a washer between the body and the frame directly under the doors that squeak.

8—You can render your car more quiet in its operation by eliminating lost motion wherever it is present.

DESIGN FOR OIL FILTER

Fort Collins, Colo.—Editor Motor Age—Please inform me how to make a cheap and effective oil filter to filter the crankcase oil after it has become fouled by carbon and wearings.—F. V.

A simple design for an oil filter which could be made at a small cost is shown in Fig. 9. It can be made from a round or square can or metal receptacle of any desired capacity, and it simply consists of a filtering material substantially suspended midway between the top and bottom of the can. The filtering material comprises, in the order shown, a fine screen on top, then a few inches of waste packed over a couple of layers of felt ½ inch each in thickness; these strainers are supported by a heavy coarse screen which is bound by a heavy wire ring, that rests on lugs soldered or riveted at intervals around the circumference of the can. Soldered lugs are preferable as there would be less liability of leakage.

The oil should be placed in the top chamber H and the outlet cock for letting the strained oil out of the lower chamber L should be placed a little above the bottom to avoid the passage of any sediment that might collect. The bottom of the vessel should curve or slant downward toward the middle, and a plug should be placed at the lowest point to facilitate draining and cleaning.

KEROSENE IN COOLING SYSTEM

Yukon, Okla.—Editor Motor Age—Regarding the use of kerosene as an anti-freeze if the engine gets real hot, will it ignite?

2—Is it necessary to use all kerosene or can one mix it with water so that it will not freeze at 10 degrees below zero? If so, what per cent of each?—L. S.

1—No.

2—Use kerosene alone. A better anti-freeze is water, 3 gallons, 1 pint; alcohol, 1 gallon, 1 quart, and glycerine, 2 quarts, 1 pint.

LEAKY STORAGE BATTERY

Weston, Ill.—Editor Motor Age—On my touring car I have a 6-volt storage battery for starting purposes. I had it charged recently and as I tried to use the self-starter found there was no spark. On examining the battery found one connection wire had been eaten in two by a collection of greenish substance on one post. Kindly give a remedy.—G. W. Eckart.

This is caused by a small leak in the filling of the top of the battery. It can be closed up by the use of marine glue, which is prepared as follows: dissolve 1 part of india rubber in crude benzine and mix with 2 parts of shellac. Heat the mixture and apply to the leak.

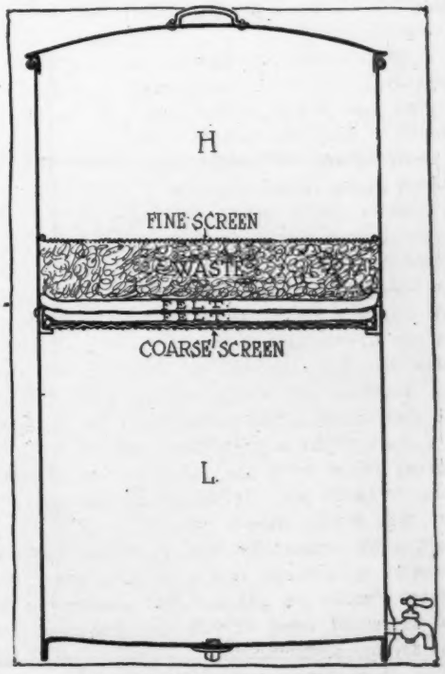


FIG. 9—HOMEMADE OIL FILTER

The Realm of the

Tire Guarantees Vary in Big Cities

Washington, Indianapolis and Columbus Can Give 9,000 Miles Because of Paving, While Chicago is Handicapped by Poor Streets—Steep Hills Hamper Pittsburgh

MAKERS are giving greater mileage guarantees on motor truck tires in some cities than in others. Tires guaranteed for 9,000 miles in Washington, Indianapolis and Columbus, are guaranteed for only 7,000 in Baltimore and Pittsburgh. In other cities these same tires are guaranteed for only 8,000. Chicago, though level and deserving of the 9,000-mile guarantee, so far as topography of the city goes, is hindered from obtaining it on account of pavement and driver conditions. The same tires which make but 9,000 miles in America are doing over 25,000 on London streets in heavy service.

The entire difference, however, is not due to the roads. The relation of the size of the tire to the weight and load of the motor truck are of primary importance and users have learned abroad that undersized tires are the poorest economy and oversized tire equipment a paying investment.

Careful Driving Necessary

It has been found that careful handling of the vehicles by the drivers has much to do with the life of a tire also, and by judicious bonus systems drivers abroad have been brought to consider the truck they are driving as a part of their business, and not something to play with, because it belongs to somebody else. As a result it is rare to see a London driver abusing his truck. Skidding is rare even on their smooth and greasy streets, though originally, before the drivers were impressed with the importance of their new work as compared with driving horses, skidding was one of the chief causes of accident and tire failure.

In 1910 it cost the London truck users 10 cents per mile for tires on 5-ton trucks. In 1911 through improving the systems, the tires, and the sizes as related to the loads, this cost was cut to 6 cents per mile for the same vehicles.

Improvement in America

Some such a gain also has been made in America. But a few years ago the first guarantees were for 6,000 miles and tire makers had a hard time to make their tires last to this mileage. Later they increased this to 8,000 miles and are making good on that. Now since rubber has gone down and tires are 50 per cent cheaper there is talk of a 10,000-mile guarantee on the part of some makers. There is no reason why this mileage cannot be reached if makers will fit the trucks with tires of the right size and users will absolutely prevent overloading and abuse of equipments.

The low life of tires in Pittsburgh and Baltimore is due largely to the topography of the city, the many hills and conditions which require low-gear work, combined with many execrable street surfaces. This costs every truck-user in these two cities a tidy little sum each year.

With good pavements and right conditions tires could make 9,000 miles in these cities. This would save 2,000 miles of life on each tire or 8,000 miles on all four. Thus in the wearing out of one tire set at present the users of each truck lose the entire service of one new tire under present guarantees in other cities or, taking an average price, about $65. On a year's service on each motor truck therefore, allowing an average mileage of 30 miles per day, each truck in Baltimore and Pittsburgh loses to its owners every year in the neighborhood of $97 worth of tire service through bad street conditions, etc., $87 loss per year on 100 trucks.

Figures on the mileage actually made by the average motor wagons running in Chicago are interesting as showing how tire mileages balance up, the guarantee being easily exceeded in the small sizes but hardly equalled in the larger. Many tires make better figures than this but the average is fair. The figures are:

REAR TIRES

1-ton delivery wagons	9,000 miles
2-ton trucks	9,000 miles
3-ton trucks	8,000 miles
5-ton trucks	7,500 miles
6-ton trucks	6,500 miles

Losses here are fairly well balanced by front equipments:

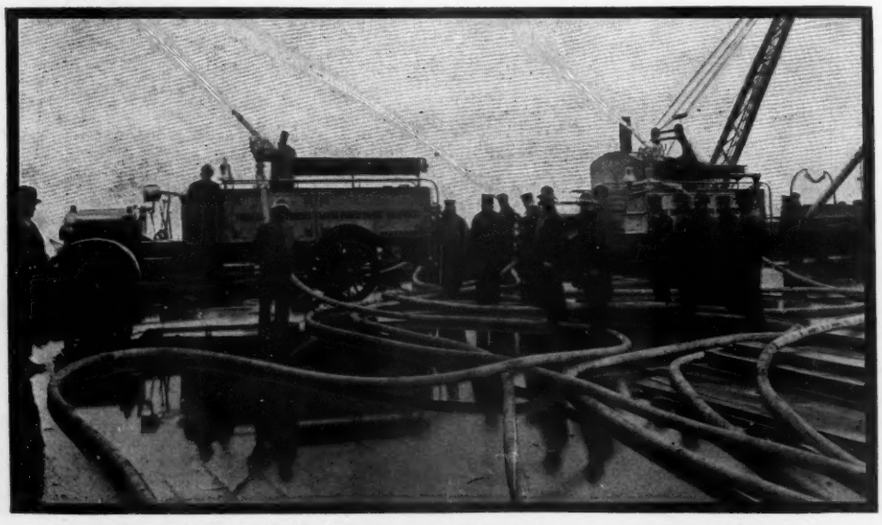
FRONT TIRES.

1-ton delivery wagons	9,000 miles
2-ton trucks	10,000 miles
3-ton trucks	10,000 miles
5-ton trucks	10,000 miles
6-ton trucks	10,000 miles

In Chicago Stock Yards

Trucks operating out of the stock yards district of Chicago have but little trouble in making their mileage on account of the lower speeds and less heating of tires. The principal trouble seems to come from stripping of tires from the rims through overloading rather than from wearing out. Cobble pavements are largely responsible for this.

Armour & Co.'s tires last for 10,000 miles on the front wheels and for 8,000 on the rear, just about making the guarantee. Swift & Co.'s trucks, using block tires on the rear as a standard equipment,



BALTIMORE'S TEST OF HIGH-PRESSURE MACK HOSE WAGONS

Commercial Car

N. A. A. M. Standardizing Truck Frames

Big Organization Suggests Two Widths and Would Graduate Length in Twenty Different Distances—Prices Set to be Charged for Use of Trucks in Demonstration Work

claim 12,000 miles as the life of the front tires and 9,000 for the rears. The Sulzberger & Sons Co. using both gasoline and electric cars, claims that the longer life is on the latter vehicles. With the electrics, tires last 10,000 miles front and 9000 rear while on the gasoline cars the guarantee of 8,000 miles is just about equalled all around. The company allow $1.25 per day per car as tire cost. The Gramm agents in Chicago figure on about one set of tires per year in average service.

The Liquid Carbonic Co. in the operation of ten trucks, five of them in Chicago, reports a cost of $3263.65 for tires last year. In this service the runs are long and stops fairly few. There is a constant load in most cases as empty gas drums are taken on when full ones are unloaded, the difference in weight between the two being comparatively little. Hard tires last with them to the 8,000-mile guarantee. Pneumatic tires of large size used on one higher speed truck lasted 10,000 miles before giving out.

Mandel Brothers' trucks on north side delivery in Chicago use up a set of tires about every 9 months, the daily mileage being around 30.

An interesting exception to the usual tire wear is shown on the trucks of the Chicago city library, single-cylinder Knox trucks of 1905 model but which are making a better showing in cost per mile than most newer machines through the system by which they are used.

A Chicago Example

On these machines the rear tires last longer than the front ones. A set of tires put on new on May 9, 1911, was run until November 2 when the front tires were worn out and had to be replaced. The rears were still doing business at the first of the following year. The tires ordinarily last 10 months on the front and 14 months on the rear wheels according to William A. Purer, under whose charge the machines are run. He places the blame for the extra wear on the front tires on the car tracks over which the machines must operate. It is cheaper on some of the routes to run on the car tracks and save the jar on the machinery than to save the tires a little by taking to the awful roads. Drivers are allowed to use their own discretion on this point.

All told, it does not seem that at present many of the trucks of 3 tons and over are making much over the 8,000-mile guarantee in Chicago. The day is coming, however, after all trucks are correctly equipped and drivers better trained, when a 10,000-mile guarantee will be possible, it is claimed. Truck users can have it when they want it and will equip and use their trucks accordingly, it is asserted.

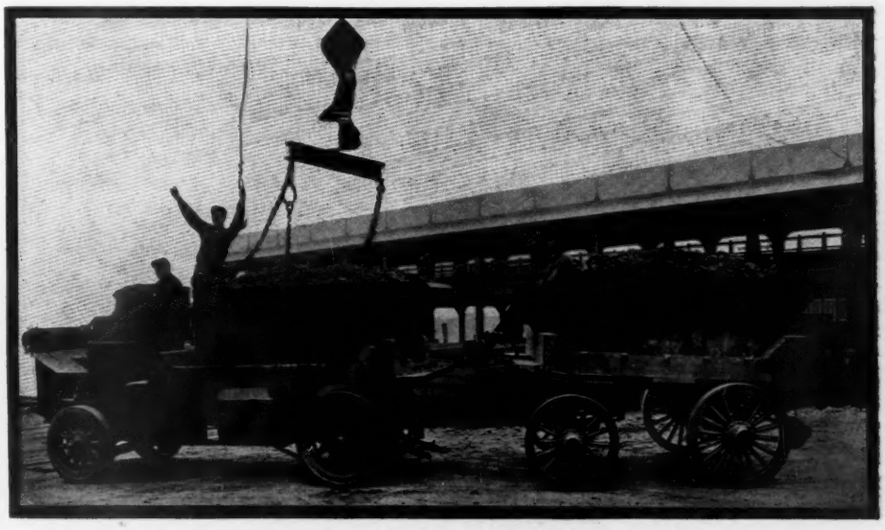
COMPETING WITH STREET CARS

What is believed to be the lowest tariff of fares charged in the country by a motor bus company has just been placed in effect by the Rapid Motortransit Co. of Indianapolis, which is now selling six tickets for 25 cents and twenty-five tickets for $1. This reduction has been made to meet the fares charged by the street railway company. The motor company has abandoned its North Meridian street line and has established a line in North Delaware street from Massachusetts avenue to Twenty-fifth street.

OFFICIAL action has been taken by the National Association of Automobile Manufacturers looking not only to the standardization of truck frame dimensions back of the driver's seat but also setting a scale of charges for demonstrations. The commercial vehicle section of the N. A. A. M. drafted these, then had them approved by the executive committee, which met in New York city, May 1.

Two widths of frames have been recommended, one 36-inch and the other 42-inch, while it is suggested that back of the driver's seat that the standard lengths shall be graduated in feet and half-feet as follows: Inches—48, 60, 72, 84, 96, 108, 114, 120, 126, 132, 138, 144, 150, 156, 168, 180, 192, 204, 210 and 216. The object in recommending these frame dimensions is to provide standard widths and lengths toward which manufacturers can work with a view to providing for interchangeability of bodies on trucks of different makes and models in the future and to enable the body builder to make up stock bodies that can be delivered without delay and placed on any make of truck.

The desirability of such standards is shown by the fact that measurements of eighty-eight different models by various manufacturers presented nineteen different widths, from 28 to 46 inches, and that upward of 100 models showed forty-one



GARFORDS USED IN NEW YORK TUNNEL WORK

different lengths of frame back of seat, from 48 inches to 218 inches. By graduating the lengths by multiples of 6 inches, from 4 feet to 18 feet it was found that these could be reduced to twenty lengths without much trouble.

In the matter of charging for demonstrations, the N. A. A. M. executive committee recommends that $10 a day be charged for the use of ½ and 1-ton trucks, $15 for 2-ton, $20 for 3-ton, $25 for 4-ton, $30 for 5 and 6-ton, $35 for 7 and 8-ton, and $40 for 9 and 10-ton.

TRUCK FOR SICK HORSES

The Louisiana State Society for the Prevention of Cruelty to Animals recently purchased from General Motors Truck Co. a specially-designed horse ambulance for use in New Orleans. The body will be mounted on a 2½-ton chassis, and has been built so as to convey sick horses in a humane way. Side and end doors are provided and the floor is mechanically operated for raising and lowering. It also can be extended outside of the ambulance for the depositing of disabled animals.

SELLING TAXI TRIP TICKETS

Trip tickets good on taxicabs have been placed on sale at the depots in New Orleans. Through the influence of the Louisiana Motor League, this step has been taken to avoid overcharges occasionally made by unscrupulous chauffeurs. During the week this system has been in operation, an increased business is reported by the taxicab companies. Encouraged by the good showing, efforts now are being made to establish a ticket system for the city taxi service. Tickets to points within the city limits, to the resorts on the lake and other places of interest, would be on sale at hotels and other taxi stands. The taxicab owners are said to favor this plan principally as overcoming the necessity of taking the most direct route from point to point. Passengers paying on a mileage basis object to being driven by a roundabout way in order to follow paved streets. The companies report much damage to cars caused by having to use unpaved streets in getting patrons to their destination by the shortest route.

THE ADAMS TRUCK

The 1 ton truck put out by the Adams Brothers Co., of Findlay, O., has a loading space the inside measurements of which are 106 inches in length and 46 inches in width. The company builds its own trucks, manufacturing everything, it claims, from the motor and radiator back to the rear axle. Accessibility has been aimed at and the water pump, oil pump and gauges, carbureter, magneto and the oil-filling funnel and breathing tube are on the right hand side. Then, too, the radiator is placed behind the engine. The driver is placed on the left. The wheelbase is 121 inches and the wheels are 36-inch, carrying solids. The power plant consists of a four-cylinder block motor with 3⅞-inch bore and 5-inch stroke.

HAWAIIAN ICE TRUCK

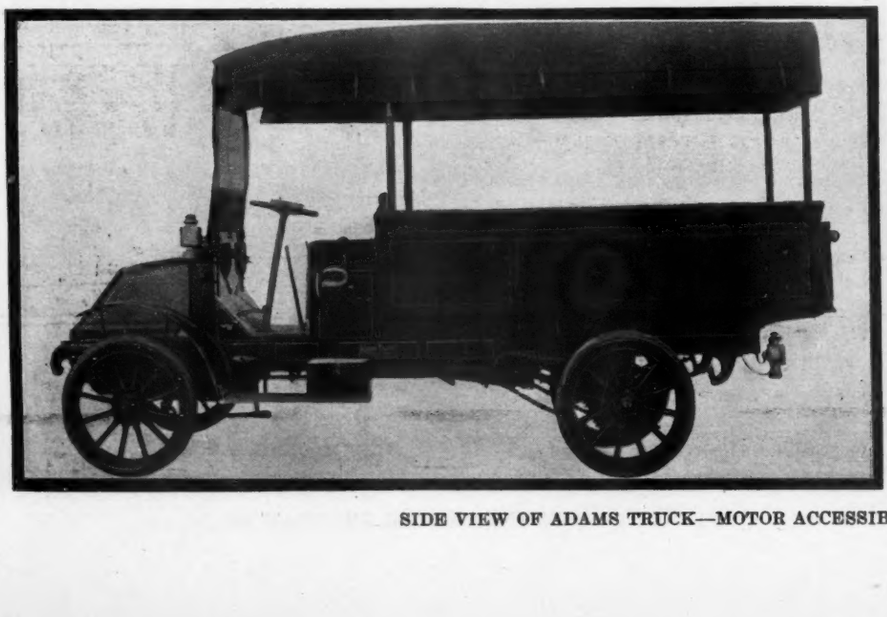
The Oahu Ice and Electric Co. of Honolulu has just placed in commission a Pierce-Arrow worm-driven motor truck of 5 tons capacity which it will use in the Hawaiian city for the hauling of ice, which is fitted with a unique body, the plans for which were made at the Pierce-Arrow factory at Buffalo. The floor and sides to the height of 24 inches are covered with heavy zinc plates which form a tank for catching water from the melting ice and drains it off at the front end of the body. The zinc plates are protected by wooden gratings. Protection from weather is given to the men on the truck while weighing the ice, by the extension of the top of the body in the rear. A lamp is attached to the rear for use in night work. The body is large enough to hold thirty-six cakes of ice of standard size.

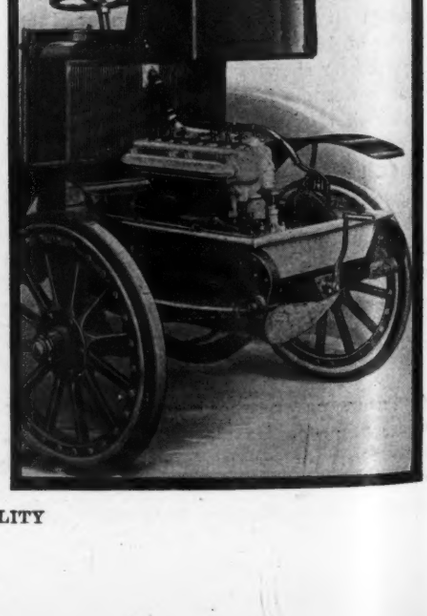
CONDEMNS FAST DRIVING

Drivers who have the speed bug are a menace to the truck industry in the opinion of H. H. Rice of the Waverley Co., of Indianapolis, who declares that the driver who throws reason to the wind in the operation of a truck and hits up too fast a pace, is unquestionably the most expensive feature of truck maintenance. Says Mr. Rice:

"Tire manufacturers, in particular, attack the speed maniac and his methods. They argue that speeding is by all odds the most expensive of all the deteriorating influences to which tires are subjected. A tire manufacturer recently said: 'It makes no difference how well solid tires are made, or to what extremes the manufacturer goes to fortify them against the incessant knocks of road travel, they will not withstand the abuses of the speed maniac. Speeding is an evil that can result in but one thing—decreased tire mileage and increased tire expense. And the particularly aggravating feature of this is that it is a matter that cannot be regulated unless a driver obeys instructions and sends the truck along at a moderate pace. Reliable drivers do this, but there always is the other fellow who, as soon as he is out of sight of the boss, throws open the throttle and burns up the pavement. Such a man is decidedly expensive to the truckowner.

" 'Demonstration has proved that at an average speed of 12 miles an hour the life of a tire is about twice what it is at an average speed of 20 miles an hour. Still higher speeds reduce the life of the tire proportionately. Therefore, it should not require any great amount of meditation to determine the effect of constant speeding upon an owner's tire bills. There are a great many conditions and abuses calculated to shorten the life of a solid tire, but of all these I have no hesitancy in placing speeding at the top of the list. Every manager of a motor service should insist upon strict observance of moderate





SIDE VIEW OF ADAMS TRUCK—MOTOR ACCESSIBILITY

speeds. Economical tire service cannot be secured in any other way than by holding the driver in check.'

"The contention of this tire manufacturer was heartily endorsed by me. It is a fact worthy of special notice that the standard speed ratings recently adopted by the N. A. A. M. commercial department are very much lower than those the gas car manufacturers have heretofore tried to obtain. The electric manufacturers urged this change a long while ago and I have personally gone on record with the commercial vehicle department to the effect that soon speeds on solid tires would be reduced because of maintenance cost.

"With the lower speeds soon going into effect it is apparent that the alleged advantages of the gas car over the electric have ceased to exist. It has become altogether a question of comparative cost of maintenance."

WANT MOTOR APPARATUS

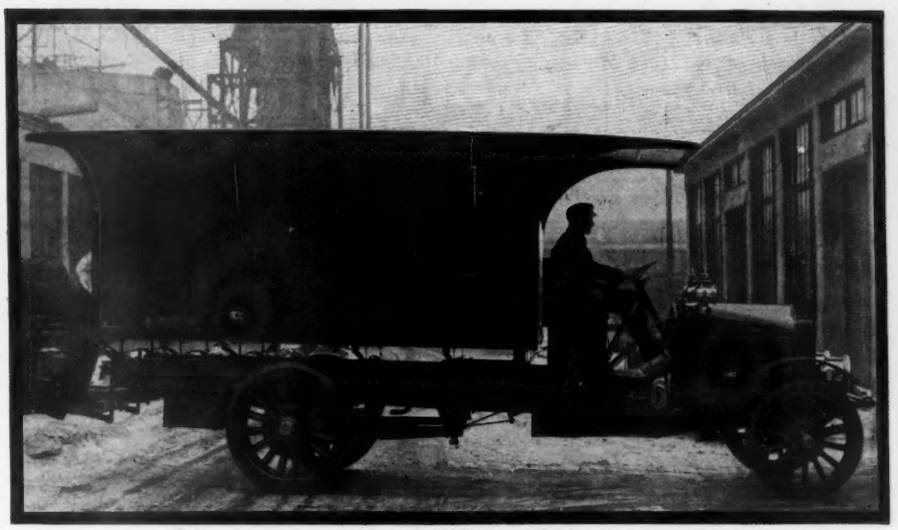
Residents of the Savin Hill section of Boston appointed a committee a few days ago to call on Mayor Fitzgerald and demand that motor apparatus be installed in the fire house that covers their district. This is the outcome of a fire a few nights ago on Sawyer avenue when the horse-drawn apparatus had great difficulty in getting up the hill to the fire. All the firemen, with the exception of the drivers, were forced to get off the apparatus and help the horses drag the engines and hose wagons up the hill, while it was necessary to lighten the ladder truck by taking off the ladders before it could be hauled up the grade. Meanwhile the fire had badly gutted a house, when if there had been a motor chemical there it would have saved the property and kept the loss down to a few dollars. Mayor Fitzgerald has promised to take the matter up with the city council and the fire commissioner in the near future.

MILWAUKEE IN MARKET

Six light roadsters for the use of the six assistant chiefs of the Milwaukee fire department will be purchased by the city of Milwaukee within 30 days under a recommendation from the fire and police committee. The motors will not exceed $1,000 each in cost. It is expected that the purchase of motor fire apparatus will be authorized within 3 months, although nothing definite in the way of scheduling the probable requirements has been done. The Milwaukee fire department at present is using no motor fire apparatus of any kind, save the ordinary pleasure cars for the chiefs. F. G. Simmons is commissioner of public works and will handle the purchases.

ROADS NOT NEEDED

"Prominent among the improvements and accessories introduced within the past few years by the farmers of the prairie provinces for facilitating his work and affording pleasure to himself and family, the motor car stands supreme," is the statement of Harry Morehouse, a prominent business man of Regina, Sask., who owns several large wheat farms in Alberta. "The level nature of the farms renders the need for roads almost unnecessary, and the conditions prevailing for motoring are perhaps more favorable than in any country on the face of the earth. The absence of hills or bush of any kind renders it possible for the prairie owner of a car to traverse his farm from one end to the other and in many cases I have seen motor trucks with their huge loads of farm produce wending their way across the country to the nearest town, on ground where no road is marked, or where a trail is not even defined. On my Alberta farms I have installed several gasoline motor plows and seeders."



PIERCE-ARROW OPERATED BY HAWAIIAN ICE FIRM

EFFICIENT MOTOR FIRE WAGON

The residents of East Boston, Mass., were given an admirable illustration of the value of a motor chemical wagon last week when a fire started among a lot of tenement houses close to the wharf of the Standard Oil works, where there are several big tanks full of fuel. A motor chemical was the first to reach the scene, getting there a few minutes after the alarm was sounded. There were three buildings on fire, but the men on the motor wagon worked fast and they had two of the buildings out by the time the rest of the apparatus arrived. The third fire then was quickly extinguished. But for the motor chemical the fire would have spread badly before the horse-drawn apparatus reached the scene.

MOTORS USED IN TUNNEL WORK

Garford motor trucks and trailers are being used in the work of breaking out and hauling away a vast quantity of rock from a deep water-works tunnel in New York city which will deliver 500,000,000 gallons of water daily from the Catskill aqueduct to the five boroughs of New York city.

The selection of motor vehicles instead of horses and wagons for this purpose was made after a number of actual tests had been carried out to determine the relative efficiency and cost of the two methods of transportation. The distance to the dump from the fartherest shaft is about 2 miles, which would have involved comparatively long trips and light loads with horse-drawn vehicles. The company now has in service one motor truck and proposes to operate six more in the near future, two trucks serving each shaft. The rated capacity of each truck is 6½ tons.

The rock excavation is raised to the surface in mining cages and dumped into elevated wooden bins at each head frame. From each bin there are three outlets in the form of inclined chutes, under which are suspended four cubic-yard skip buckets, which are filled by opening gates in the chutes. A motor truck, to the rear of which a trailer is attached, is then driven under the skip and the latter is lowered upon the wooden framework of the truck, which is designed especially to carry the detachable skips. With the trailers 13 tons of material are taken away each trip. On arriving at the dump the skips are lifted off the trucks by derricks and their contents dumped into the river.

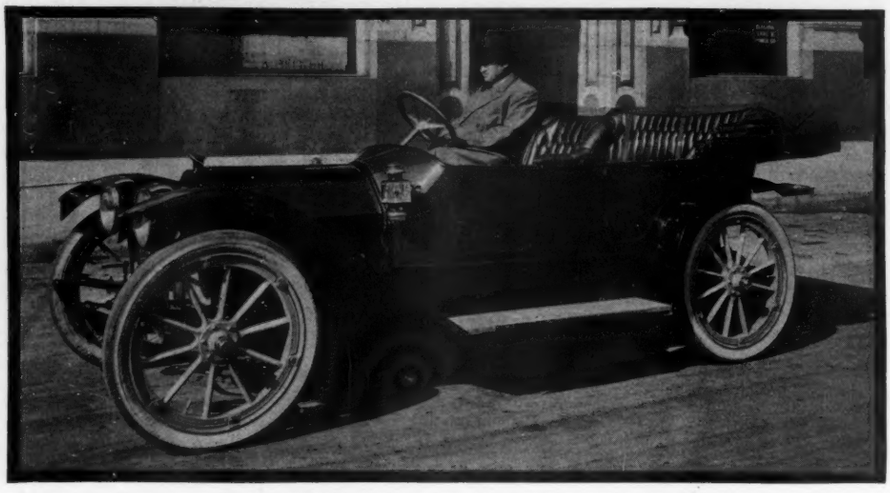
An additional advantage of the trucks, it is said, is that they may be operated night and day to serve the three daily 8-hour tunnel shifts, while with horses it would be necessary to have relays of animals to prosecute the work continuously.

MONTREAL WANTS CIVIC GARAGE

Fire Chief Tremblay of Montreal has submitted to the board of control a recommendation that the city build at a cost of $100,000 a civic garage and workshop where may be repaired all apparatus belonging to the fire and police departments as well as the motor cars at present used or which may be later acquired for police and fire services. The board of control will look into the recommendation.

Montreal is much impressed with the utility of the motor car for civic use and its citizens are backing up the authorities.

From the Four Winds



FIRST OF THE OMAHA MOTOR CAR CO.'S PRODUCT

ALBANY Helping Tourists—The Albany Automobile Club, of Albany, N. Y., has opened a touring department and has engaged an experienced director, who is surrounded with road maps of every state in the union.

Kenosha Club Growing—The Kenosha Automobile Club, organized only a few months ago at Kenosha, Wis., had already exceeded the 200 figure in membership, making it the largest club in Wisconsin save Milwaukee.

Assess at One-third Cost—At the annual meeting of assessors in Freeborn county, Minn., at Albert Lea, it was decided to assess motor cars at one-third cost. For the 140 cars owned by 130 persons in the county seat the average value is $1,200, it is estimated. The town has four agencies and three large garages.

Experience Demanded—In response to a request from the Minnesota State Chauffeurs' Association, the state board of examiners has ruled that an applicant for state license must have at least 3 months of actual driving or garage experience before he can have a license. The action is the result of an effort of the state association to protect experienced men. The association has obtained new quarters on Sixth street, St. Paul.

Governor Tener Fined—Governor Tener of Pennsylvania was notified by the police authorities of Reading that he had exceeded the speed limit with his car while passing through that city, and that his fine amounted to $11.25. A check for the amount was sent to the Reading authorities, who had entered suit against the owner of license No. 1, belonging to the governor. Accompanying the check was a letter stating that while the state, the owner of the car, could not be sued, the governor desired to live up to the law. It was stated that there was no intention to exceed the speed limit and that he had gone through the town a dozen times at the same speed before while on business for the state, but no notice was ever given to him.

Ride for G. A. R. Veterans—For the first time since the club was organized the Milwaukee Automobile Club has offered the use of its members' cars to the local posts of the G. A. R. for the Memorial day parade and the committees on decoration of the graves in the various burial grounds.

Another Surrender—Residents of Prince Edward Island, in the Canadian province of that name, have asked the legislature to repeal the law which prohibits motor cars being used on the island. They figure that they lose annually something like $90,000 of tourists' money because of the law. It is said no motor car ever has been run on the island, despite the fact that it is noted for its scenic beauties.

Ohio Collects Tag Money—The sum of $56,941.10 has been turned over to the state treasurer at Columbus, O., as a result of the collection of money for motor licenses issued during the year. This money under the law will be credited to the good roads fund and expended in the improvement of highways in various parts of the state. This was the second installment coming from that source during the year.

Texans to Build Clubhouse—The San Antonio Automobile Clubhouse Co., of San Antonio, Tex., has filed its charter in the secretary of state's office. It has a capital stock of $6,000 and its incorporators are W. E. Milligan, W. J. Pearson, Dr. F. J. Fielding and others. The new company is a subsidiary of the San Antonio Automobile Club. The latter recently purchased a tract of 20 acres on the North Loop highway, about 10 miles from San Antonio. Plans have been adopted for improving the grounds and for the erection of a clubhouse building at a cost of $8,000.

Wisconsin Bankers Helping—The Wisconsin Bankers' Association, member of the American Bankers' Association, has taken a decided interest in the good roads problem as an economic proposition and is now co-operating with the various agencies which are promoting the improvement, construction and maintenance of highways.

Clubs Help Build Road—At a meeting of the Idaho Falls Automobile Club, the Idaho Falls portion of the $15,000 needed to complete the state road over the famous Ross Fork sand bridge was raised. The motor clubs of Blackfoot, Pocatello and Idaho Falls have now placed at the disposal of the state all the funds needed to complete the work started a year ago, when $20,000 of state funds were expended on this highway.

Minnesota's Count—April receipts for motor license tags for 1912 are reported by the Minnesota secretary of state as $16,101, compared with $5,082 last year. In the month 7,600 motor car tags were issued, 1,398 motor cycle licenses, 698 for chauffeurs and fifty-seven for dealers. For this year 18,500 licenses have been issued for motor cars as compared with 19,200 for the entire year of 1911. April receipts were the largest since the office was opened.

To Spend Its Money on Roads—The Fergus Falls Automobile Club of Fergus Falls, Minn., has voted to spend all its money on roads in the future, to buy and use split log drags and arrange for signboards in preparing its part for the Twin City-Fargo, N. D., highway. Officers were elected as follows: President, Dr. J. A. Freeborn; vice-president, A. G. Anderson; secretary-treasurer, G. W. Harris; governors, Elmer E. Adams, Cyrus Beall, K. H. Bergerud, O. A. Fetvedt, A. B. Cole, John Lauritzen.

Wyoming Improving Trail—The state of Wyoming intends to lighten the labor of the transcontinental tourist this summer if work on the state roads counts for anything. Contracts have been let for a short cut from Table Rock to Point of Rocks which will save about 40 miles on the present route. This new road will cut out the famous Bitter Creek stretch of alkali mud which is generally believed to be the worst stretch of road in the state. On top of this comes the information that a new short cut between Granger and Evanston will save about 80 miles. The latter road includes the construction of two bridges, costing about $60,000.

Work on these structures are about completed. It is expected both new roads will be finished in time for the coming summer's travel.

Louisville Club Moving—The Louisville Automobile Club, now located in the Commercial building, Fourth and Main streets, will move into its new club rooms in the new Henry Watterson hotel on Walnut street about May 15.

Home for York Club—The Lang property on the Keesey tract along the Wrightsville pike at York, Pa., has been purchased by the York Motor Club as a permanent home. The property was built at a cost of approximately $20,000, but never has been occupied.

Minneapolis Fights the Cut-Out—Trustees of the Automobile Club of Minneapolis have elected seventy-five new members and decided to take steps to stop the muffler cut-out nuisance which is contrary to state law. The club has begun work on out-of-town roads preparatory to spring traffic. The road to the country club at Bloomington has been repaired. It has been decided to maintain an up-keep system with the club's money instead of doing much new road work.

Helping Consumptives—Milwaukee's first floral motor parade was held on Saturday, May 4, as a feature of the first annual flower day for the benefit of the tuberculosis sufferers of Milwaukee. The event was held under the auspices of the Milwaukee Society for the Care of the Sick, and the Milwaukee Automobile Club co-operated in furnishing cars for the procession and the transportation of committee members and flower girls. For the purpose of collecting funds for the tuberculosis sanitarium for Jackson, Mich., a motor day was held at which time car owners let out their machines for hire, the money collected for fares going for the sanitarium project. Thousands of persons rode in the machines.

Cars for Panama—Ten motor cars passed through New Orleans last week consigned to the canal commission at Colon. This is a part of the recent order of cars for the use of the police and engineers, whose duties require their presence at different points on the canal.

Indiana Registrations—In the report of motor registrations for the state of Indiana for April a new record for that month is shown. There were 2,674 registrations, the largest number for the month of April of any year. In April, 1911, there were 1,623 registrations, which at that time established a new record for April. The motor car business in Indiana this season is exceeding all expectations.

To Show the Commissioners—The date for the inspection tour of all of the townships in McLean county, Ill., by the motorists and highway commissioners has been fixed for June 5. Fifty cars will be engaged and all of the commissioners will be invited to participate. The party will visit every township in the county, the object of the tour being to show the commissioners the condition of the roads in each district.

Pushing Waubonsie Trail—The Waubonsie Trail Association is pushing the trail northward through Illinois to Chicago and has enlisted the support of the newly organized Illinois Valley Automobile Association. The main line of the trail crosses Illinois east and west. From Peoria it is proposed to extend a road to Chicago, going through Wenona, Starved Rock park, Ottawa, Joliet and Chicago. It is desired to form county trail associations in La Salle and Will counties in order that the highway selected will be kept up as required.

GREAT WESTERN THAT IS BLAZING TRAIL FOR INDIANA STATE TOUR

Another Minnesota Club—The New Ulm Automobile Club has been formed in Minnesota. Dues are $5 and the money will be used in putting up guide posts. The officers are: President, E. G. Hage; vice-president, J. H. Siegel; secretary-treasurer, A. Schiller.

Gophers Plan Sociability—The Redwood Falls Automobile Club will run its second annual reliability tour about July 17. The turning point will be Albert Lea and the tourists will return by way of Minneapolis. The club is one of the leading members of the Minnesota State Automobile Association.

Columbus to Signboard—The Columbus Automobile Club, of Columbus, Ohio, has taken up the question of erecting both direction and danger signs on all of the highways within a radius of 60 miles of the Buckeye capital. To that end a committee has been named and a large number of signs ordered. Within a short time members of the club will erect the signs on all of the roads of central Ohio. The club will co-operate with clubs in surrounding cities and towns in erecting signs of that character over all of Ohio.

Club at Waukesha, Wis.—The Waukesha Motor Club was organized at Waukesha, Wis., with seventy-four charter members on May 2, with the following officers: President, George B. Harris; vice-president, Henry E. Blair; secretary and treasurer, A. L. Blackstone. The club was organized as the result of the efforts of the Milwaukee Automobile Club and Wisconsin State Automobile Association, both of which sent large delegations to Waukesha for the organization meeting. Waukesha is but 19 miles west of Milwaukee.

Pennsylvania Has 40,000—The Pennsylvania state highway department last week issued license No. 40,000 and broke all records for putting out the number of plates which are evidence of registration. The issue is only 4,272 behind the total registration of cars last year, and as 34,351 was the total of 1909, the best previous year, it is evident that the people of Pennsylvania are spending large sums for motor cars. The 40,000 cars licensed do not include 3,000 dealers, who are in a separate classification.

May Change Club's Name—A proposition to change the official title of the Milwaukee Automobile Club to Milwaukee Motor Club is now being considered. Since the club was incorporated in 1905 the initials have been repeatedly confused with those of the Milwaukee Athletic Club. Then, too, the club desires a title more expressive of the basis of its organization, which covers all kinds of motor vehicles. It is figured that the change will not involve any large money consideration, although the organization is a large one and has 600 members.

National Puts Series V on 1913 Market

FOR the balance of the 1912 season and for what will be the season of 1913, the National Motor Vehicle Co., Indianapolis, is manufacturing a new motor car design known as the series V.

This new model differs from previous National designs in several marked respects: The steering mechanism is on the left-hand side of the car, and the gear-shifting and emergency-brake levers are centrally located. To accommodate the rearrangement of the steering gear, the outside equipment of the motor also has been entirely changed about; so that the appearance of the right side of the motor, now is identical with that of the left side of the late model S series of 1912, and the left side of the new motor resembles the right side of the last series. Among other important changes in the motor, the bore of the cylinders is reduced from 5, to 4⅞ inches; and the stroke of the pistons increased from 5⅞ to 6 inches. Valves are inclosed in dust-proof sleeves; and a Prest-o-Lite acetylene self-starting mechanism is fitted.

Some of the Changes

Changes also are to be found in the gearset; the propeller shaft no longer is inclosed in a torsion tube, but has two universal joints with the torque absorbed by a long tapering pressed steel torque member; the rear-axle is of new design but still of the floating type; the wheel base of the roadster has been reduced from 124 to 120 inches, and that of the touring car and toy-tonneau increased from 124 to 128. Wheels are equipped with larger tires and Firestone demountable rims. The roadster now has 34 by 4½-inch tires all around; 36 by 4½ tires are used on the toy-tonneau and five-passenger touring car; and the seven-passenger touring car is equipped with 36 by 5-inch tires.

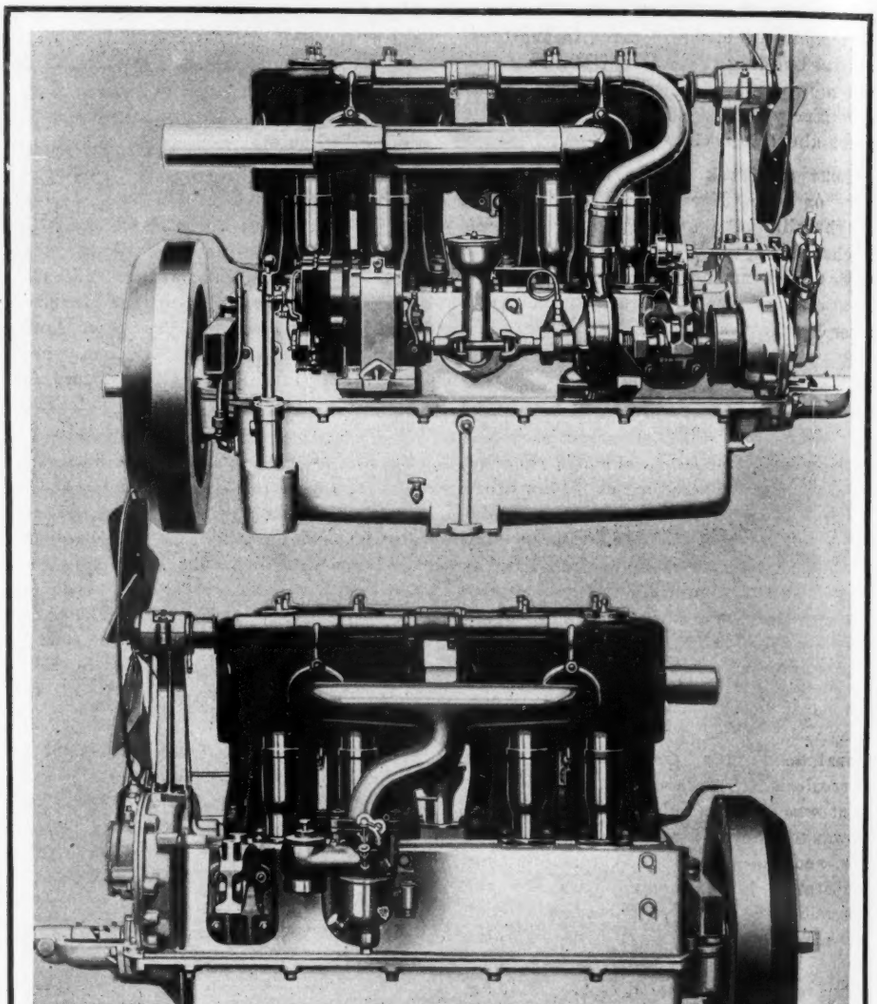


FIG. 2—RIGHT AND LEFT SIDE VIEWS OF THE NEW NATIONAL MOTOR

A general idea of National design may be obtained from the accompanying illustrations; while a description of the changes in detail will serve to give a very fair description of the mechanisms. The chief object of the National company in producing the new series V model has been a general refinement of details of construction.

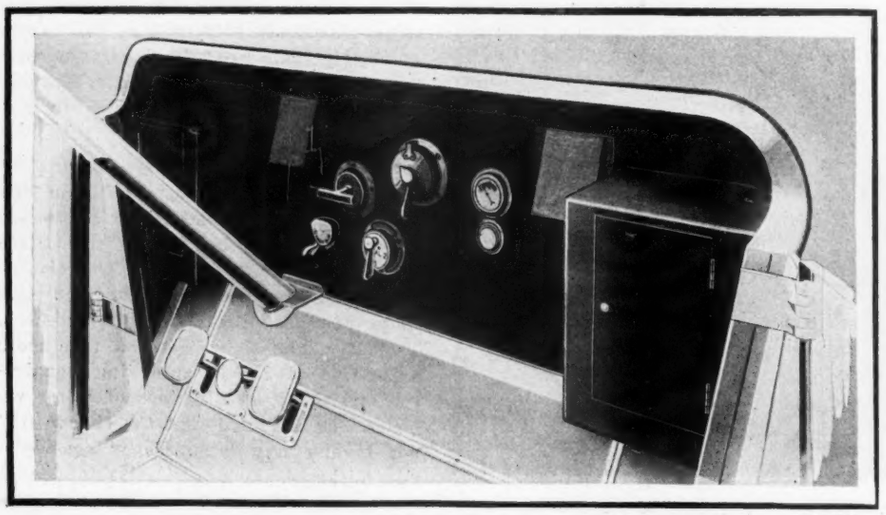


FIG. 1—DASH-BOARD OF THE SERIES V NATIONAL

The circulating splash lubrication system which long has been a feature of National cars remains unchanged in the new model. The lower removable portion of the motor crankcase is divided horizontally by partitions which convert the lowermost portion into a reservoir, and the upper portion into splash basins. The oil is drawn from the reservoir by a gear-driven gear pump and forced through a sight on the dash. From this it returns to a passage on one side of the case which conveys the lubricant to the splash basins, and to the helical engine gears at the forward end. There are scoops on the ends of the connecting rods that serve not only to force oil into the lower connecting-rod bearings, but which also create a mist of oil inside of the motor

that keeps all internal mechanisms thoroughly lubricated. Large pockets are formed above the three main bearings of the crankshaft, and a copious supply of oil constantly drains into these pockets when the motor is in operation. The overflow from the splash basins of the upper partitions returns to the reservoir below where strainers are provided to cleanse the oil before it is again drawn into the pump for recirculation.

The Ignition System

Ignition is by means of a Bosch duel double-distributer magneto on the touring and toy-tonneau cars, and by a Splitdorf dual double-distributer magneto on the roadster. These systems give two synchronized sparks in each cylinder for each explosion, there being two plugs, one in the inlet and one in the exhaust valve chambers. A battery is employed to facilitate starting. The magneto is conveniently arranged on a substantial bracket integral with the upper portion of the crankcase on the right side. It is driven from a shaft that passes through the water pump and a suitable flexible coupling is provided between the pump and magneto.

In the cooling system, a large centrifugal pump promotes the water circulation; and a belt-driven adjustable ball-bearing fan creates a draft through a cellular type of radiator which is mounted on trunnions. The water from the radiator enters the water-jackets of the cylinders directly above the exhaust valve chambers, where the heat is greatest, and it leaves the jackets at a similar point opposite the inlet valve chambers.

A 1¾-inch Schebler carbureter is used on all types, except the roadster which takes a 2-inch size; and an option is granted of a Miller carbureter on the roadsters, or a Diezemann on the touring and toy-tonneau cars. Dash control of air to the carbureter is provided on all models; and the auxiliary air valve on this intake pipe, which is operated from the steering post, is retained.

Pressure feed now is used on the gasoline tanks, the pressure being obtained from a small plunger pump driven off the camshaft, which pumps up to about 2 pounds and keeps the pressure always between 1 and 2 pounds. All tanks this year are equipped with a fine mesh wire screen for separating gasoline and water.

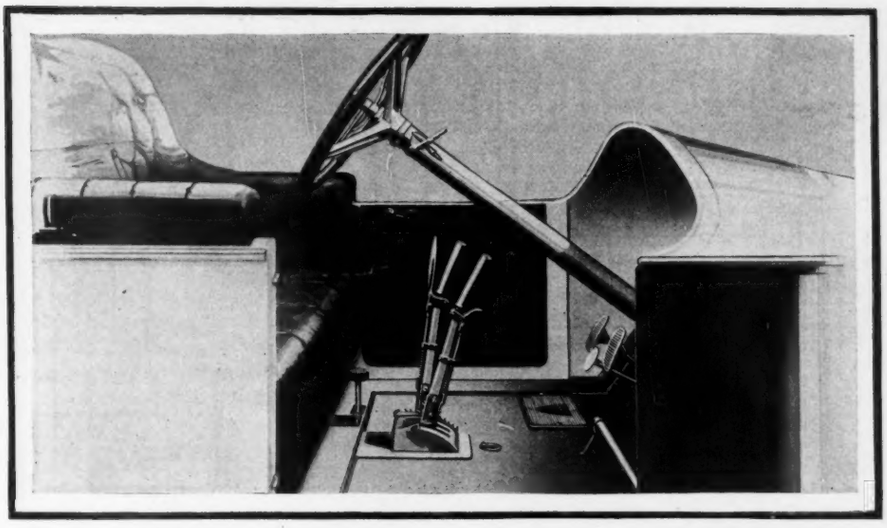


FIG. 4—SHOWING CENTRAL CONTROL LEVERS OF NEW NATIONAL

Features of Engine

The crankshaft and all studs used in the engine are made of chrome vanadium steel. Main bearings are of Parson's white bronze; and connecting-rod bearings are of bronze with a softer white metal filler.

The tire pump is small and compact, of the one-cylinder type, conveniently and neatly secured to the front end of the engine gearcase, and driven off the forward end of the exhaust camshaft. It is driven through a cone clutch which is only thrown into engagement when desired.

By turning the transmission gearset end

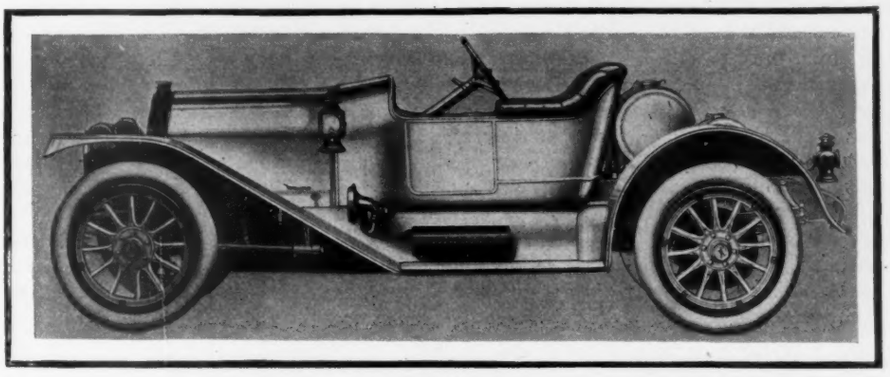


FIG. 5—THE NATIONAL ROADSTER FOR 1912 AND 1913

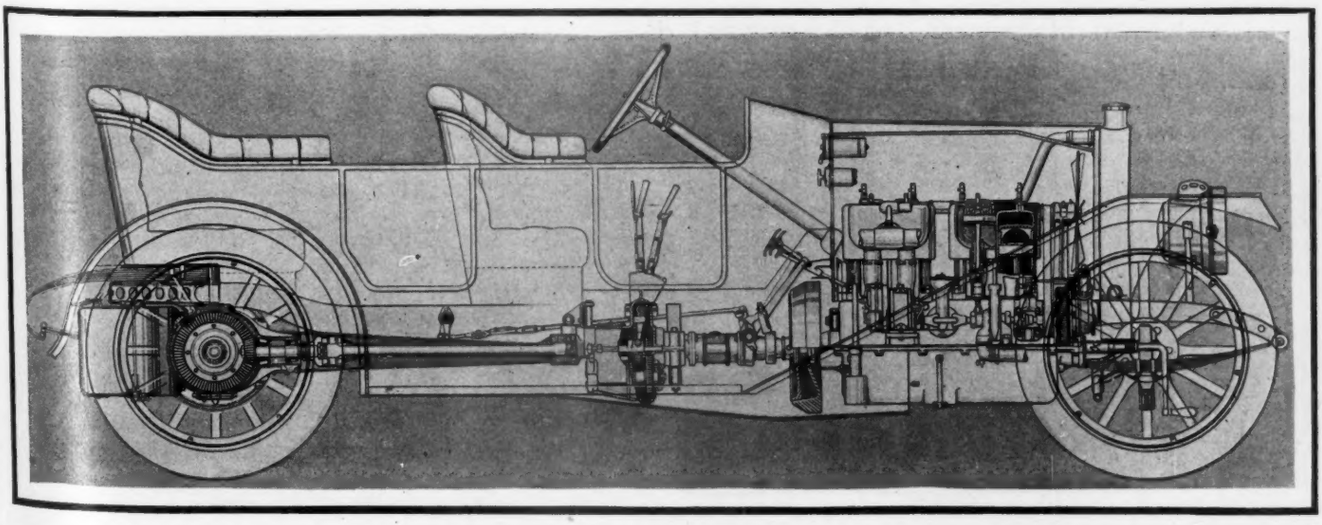


FIG. 3—PART SECTIONAL VIEW OF THE NEW SERIES V NATIONAL MOTOR CAR

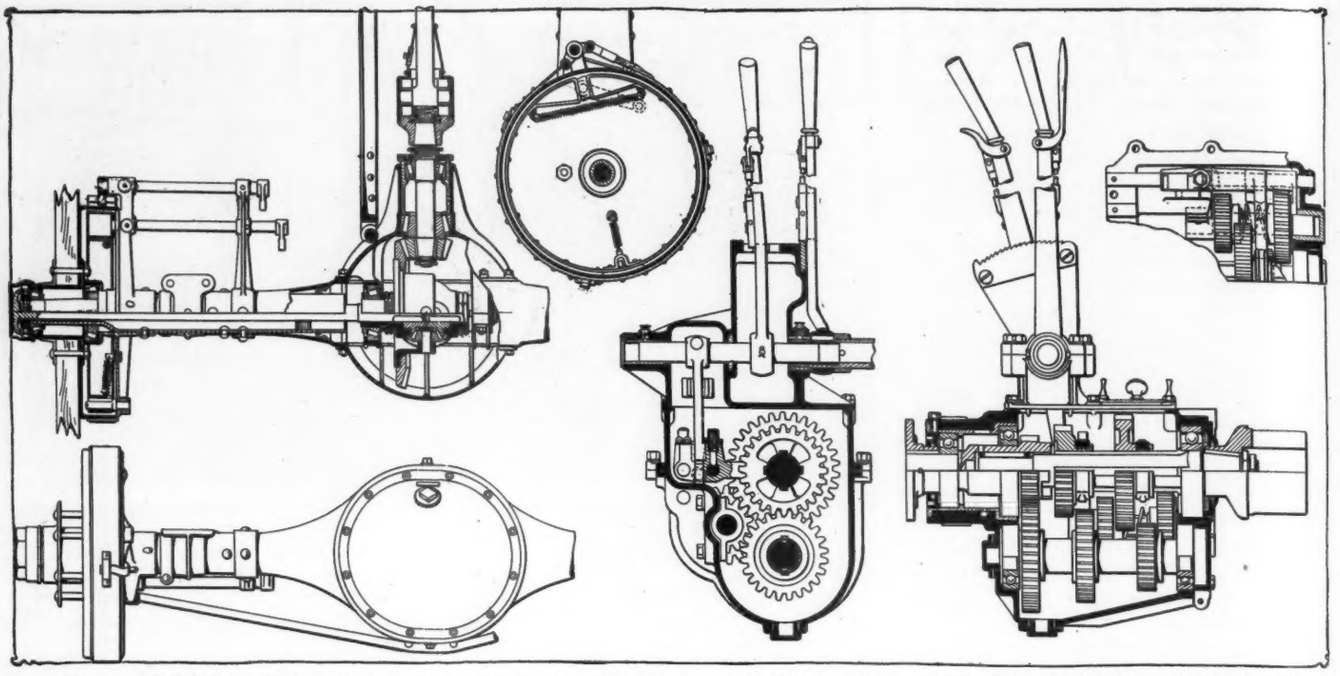


FIG. 6—SECTIONAL VIEWS SHOWING DETAILS OF SERIES V NATIONAL'S REAR AXLE AND CHANGE-SPEED GEARSET

for end, so to speak, so that the countershaft runs at a much lower speed than on previous models; and by means of an improved special form of cutting the gear teeth, absolutely quiet operation of the gearset is claimed to have been obtained. Annular ball bearings are employed in this gearset.

From the transmission gearset back, the rear system is entirely new. Instead of a propeller shaft inclosed in a torsion tube and with but one universal joint at its forward end; the new propeller shaft has two universal joints and is not inclosed, the torsional strains being absorbed by a pressed steel torsion member. The rear-axle has a new design of pressed steel housing with a large steel support which holds both the bevel driving pinion and gear, and the differential mechanism. This makes a substantial driving gear unit which will permit of the possible dis-alignment of the housing without the mesh of the gears being affected. Timken roller bearings are used in the rear axle; the axle remains a float type; but the brakes which are of the internal expanding and external contracting design, are considerably wider, and lined with Thermoid.

Front Axle Construction

The front axle is a one-piece drop-forging of I-beam section, with the steering knuckles equipped with Timken roller bearings at the top of the yokes and on the wheel spindles. The pressed steel frame is mounted on semi-elliptic front springs and three-quarter scroll elliptic rear ones. All models of this series are equipped with special tire irons in the rear; and broad plain fenders with substantial irons are fitted. All of the driving parts, such as inner axles, pinion shafts, etc., subject to torsional strains, are made of the best chrome nickel steel; all parts subject to vibration, such as the crankshaft and camshafts are made of chrome vanadium steel; and the gears are made of silico manganese steel. There are more than 500 parts in the series V car made of pressed steel; and all studs and bolts are made of especially heat-treated chrome nickel steel. Herein lies much of the refinement, and the use of the proper metals, for the work for which they are best adapted, has done much to increase the durability and efficiency of the up-to-date motor car.

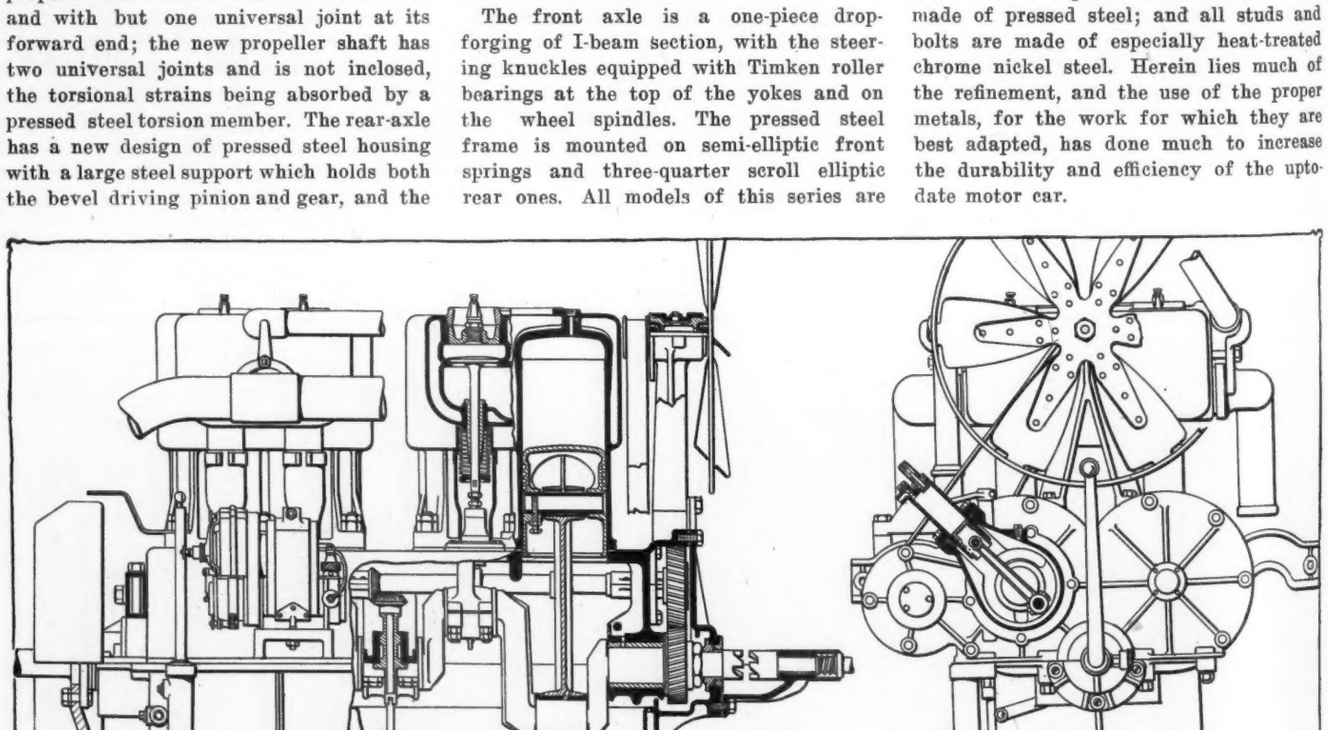


FIG. 7—SECTIONAL DRAWINGS OF SERIES V MOTOR SHOWING FEATURES OF NATIONAL DESIGN

The Mathematics of Motoring

TO the non-technical motorist an attempt to calculate the exact power that may be expected from a motor of any given size offers many difficulties. The element of uncertainty is great in any results arrived at by the use of any of the many formulae compiled for determining the horsepower by any other than the brake-load or dynamometer tests.

Those seeking information on the subject generally are referred to the S. A. E. formula, originally known as the A. L. A. M. formula. This is, and has been for many years, the standard formula for rating motors as to horsepower in America, and in Great Britain as well, where it is known as the R. A. C. formula, from the fact that it was officially adopted by the Royal Automobile Club of Great Britain. This rating is obtained by squaring the diameter of the bore of the cylinders in inches, multiplying by the number of cylinders of the motor and dividing the product by 2.5, or what is the same thing, multiplying the square of the bore by the number of cylinders and then multiplying by 0.4.

It is obvious that all motors of the same number of cylinders and the same diameter of cylinder bore will be rated the same, no matter what their length of stroke or speed of revolution—two factors which materially affect the actual horsepower delivered. The series of tests upon which the formula was determined showed that it gave good average results with motors having a piston speed 1,000 feet per minute; and further that at that time most of the motors on the market were designed for something near this speed, no matter what their stroke. That is, the crankshafts of motors having the longer stroke rotated the less rapidly, so that the distance traveled by the piston was approximately 1,000 feet in each minute. As a matter of fact, there were very few motors whose stroke was not nearly the same as the bore at the time the formula was officially adopted.

The standard horsepower formula is mathematically correct, so far as its derivation is concerned, but is based upon three assumptions, all of which were at the time of its adoption open to criticism, and are still more so in this day of long-stroke and high-speed motors. It was assumed that all motor car engines deliver their rated power at a piston speed of 1,000 feet per minute, that the mean effective pressure on the pistons averages 90 pounds per square inch and that the mechanical efficiency of the engines averages 75 per cent. Upon these assumptions the derivation of the S. A. E. horsepower formula is as follows:

S. A. E. Horsepower

The indicated horsepower of a four-cycle engine is equal to one-fourth the mean effective pressure P acting throughout the working stroke, times the area A of the piston in square inches, times the piston speed S, times the number of cylinders N, divided by 33,000, thus—

$$\text{I. H. P.} = \tfrac{1}{4}\,\frac{PASN}{33{,}000};$$

multiplying by the mechanical efficiency E of the engine gives the brake horsepower. So the complete equation for the brake horsepower of an engine becomes

$$\text{B. H. P.} = \frac{PASNE}{4 \times 33{,}000}$$

Substituting the assumed values for piston speed, mean effective pressure and efficiency, and substituting for A its equivalent in terms of the diameter, .7854 D^2, we have,

$$\text{B. H. P.} = \frac{90 \times .7854 \times 1{,}000 \times N \times .75}{4 \times 33{,}000}$$

Combining the numerical values, the equation simplifies to

$$\text{B. H. P.} = \frac{D^2N}{2.489}$$

or in round numbers,

$$\text{H. P.} = \frac{D^2N}{2.5}$$

where D equals the bore of the cylinder in inches, N equals the number of cylinders and H. P. equals the brake horsepower.

A more easily remembered form of the formula is H. P. = .4 D^2N, which means the same thing.

No one holds that the S.A.E. formula gives exact results, and dissatisfaction is expressed often with the rating as obtained by it. Nevertheless, there are other factors which have as great a bearing upon the horsepower of a motor as the stroke and speed of revolution, and these are points of design, such as valve diameter, valve lift and weight and balance of moving parts, for which no adequate formula could be devised. Several formulae have been proposed which very nearly fulfilled the conditions required, but they are so cumbersome and have so many varying factors they are too complicated for the ordinary man to employ.

Since, then, it is impracticable to employ a formula which will give exact results, it is believed that the best formula is the one which gives fair results in the average cases, and is at the same time simple enough to be universally understood and used.

S.A.E. Standard Horsepower Rating

Bore of Cylinder squared by number of cylinders divided by 2.5

Bore			S. A. E. Horsepower			
Inches		Mill.	1 Cyl.	2 Cyl.	4 Cyl.	6 Cyl.
2 1/2	2.50	64	2.5	5.0	10.0	15.0
2 5/8	2.63	68	2.8	5.5	11.0	16.5
2 3/4	2.75	70	3.0	6.0	12.1	18.2
2 7/8	2.88	73	3.3	6.6	13.3	19.9
3	3.00	76	3.6	7.2	14.4	21.6
3 1/8	3.13	79	3.9	7.8	15.6	23.4
3 1/4	3.25	83	4.3	8.5	16.9	25.4
3 3/8	3.38	85	4.6	9.1	18.3	27.4
3 1/2	3.50	89	4.9	9.8	19.6	29.4
3 5/8	3.63	92	5.3	10.5	20.3	31.6
3 3/4	3.75	95	5.6	11.3	22.5	33.8
3 7/8	3.88	99	6.0	12.0	24.0	36.1
4	4.00	101	6.4	12.8	25.6	38.4
4 1/16	4.06	103	6.6	13.2	26.4	39.6
4 1/8	4.13	105	6.8	13.6	27.3	40.9
4 1/4	4.25	108	7.3	14.5	28.9	43.8
4 3/8	4.38	111	7.6	15.3	30.6	45.9
4 1/2	4.50	114	8.1	16.2	32.4	48.6
4 5/8	4.63	118	8.6	17.1	34.3	51.6
4 3/4	4.75	121	9.0	18.0	36.1	54.1
4 7/8	4.87	123	9.5	19.0	38.0	57.0
4 15/16	4.94	125	9.7	19.5	39.0	58.5
5	5.00	127	10.0	20.0	40.0	60.0
5 1/8	5.13	130	10.5	21.0	42.0	63.0
5 1/4	5.25	133	11.0	22.0	44.1	66.2
5 3/8	5.38	137	11.6	23.0	46.0	69.1
5 1/2	5.50	140	12.1	24.2	48.4	72.6
5 5/8	5.62	143	12.6	25.3	50.6	75.9
5 3/4	5.75	146	13.3	26.5	53.0	79.5
5 7/8	5.87	149	13.8	27.6	55.3	82.9
6	6.00	152	14.4	28.8	57.6	86.4
6 1/4	6.25	158	15.6	31.3	62.5	93.8

Computed at 1,000 feet per minute piston speed

Current Motor Car Patents

PATENTS ISSUED APRIL 30.

1,024,495—Electric Lighting System. Edgar Booth and Norman Russell Booth, Halifax, Eng. Filed October 26, 1910. Serial No. 589,254.

1,024,567—Motor Car Front. Albert E. Gooderham, Toronto, Ontario, Canada. Filed August 13, 1907. Serial No. 388,298.

1,024,577—Primary Battery. Charles E. Hite, Burlington, N. J. Filed July 27, 1907. Serial No. 385,921.

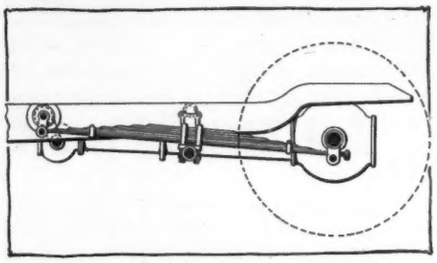


FIG. 1—ROYCE SPRING DESIGN

1,024,578—Traction Vehicle. Henry A. Howard, Lloydminster, Saskatchewan, Canada. Filed April 15, 1911. Serial No. 621,237.

1,024,579—Crankcase. Russell Huff, Detroit. Mich., assignor to Packard Motor Car Co., Detroit, Mich., a corporation of Michigan. Filed August 7, 1911. Serial No. 642,712.

1,024,580—Roller Clutch. Hugh M. Hunter, Cleveland, Ohio, assignor to the National Acme Mfg. Co., Cleveland, O., a corporation of Ohio. Filed March 30, 1911. Serial No. 617,830.

1,024,581—Reciprocating Engine. Andrew J. Jackson, Chicago, Ill., assignor of one-tenth to Norman V. Christensen, Chicago, Ill. Filed July 6, 1911. Serial No. 637,140.

1,024,587—Electric Circuit Controlling Apparatus. Thomas L. Lee, Jr., Westfield, N. J., assignor to the Hall Signal Co., a corporation of Maine. Filed June 29, 1910. Serial No. 569,425. Renewed December 19, 1911. Serial No. 666,839.

1,024,588—Electric Circuit Controlling Apparatus. Thomas L. Lee, Jr., Westfield, N. J., assignor to the Hall Signal Co., a corporation of Maine. Filed February 12, 1910. Serial No. 543,540. Renewed Dec. 19, 1911. Serial No. 666,840.

1,024,597—Electrolytic Cell. Oscar H. Pieper and Alphonse E. Pieper, Rochester, N. Y. Filed October 9, 1908. Serial No. 456,922.

1,024,601—Terminal Attachment Engaging Device. Jospeh E. Schaefer, Jr., Detroit, Mich., assignor, by mesne assignments, to American Ignition Co., Detroit, Mich., a corporation of Michigan. Filed August 18, 1910. Serial No. 577,792.

1,024,618—Explosion Engine. Howard E. Coffin, Detroit, Mich. Filed June 27, 1910. Serial No. 569,063.

1,024,619—Explosion Engine. Howard E. Coffin, Detroit, Mich. Filed April 20, 1911. Serial No. 622,291.

1,024,634—Convertible Motor Car. Albert Klell, West Park, Ohio, assignor of one-half to Henry Barnes, Cleveland, Ohio. Filed September 21, 1910. Serial No. 582,968.

1,024,636—Side-Dump Motor Truck. George Washington Lally, Boston, Mass. Filed April 9, 1910. Serial No. 554,505.

1,024,652—Motor Road Vehicle. Frederick Henry Royce, Derby, England. Filed October 28, 1911. Serial No. 657,342.

1,024,658—Folding Storm Front for Motor Cars. James E. Stevenson, Puyallup, Wash. Filed October 19, 1909. Serial No. 523,532.

1,024,672—Lubricant Cup. George W. Bowen, Auburn, N. Y. Filed May 24, 1909. Serial No. 497,855.

1,024,673—Grease Cup. George W. Bowen, Auburn, N. Y. Filed August 7, 1911. Serial No. 642,746.

1,024,675—Combined Coupling and Steering Mechanism. Tracy V. Buckwalter, Altoona, Pa., assignor of one-half to Axel S. Vogt, Philadelphia, Pa. Filed March 9, 1911. Serial No. 613,379.

1,024,688—Muffler. Edward Dudley Lewis, Elmira, N. Y., assignor to Heater-Muffler Co., Elmira, N. Y., a corporation of New York. Filed August 9, 1911. Serial No. 643,229.

1,024,709—Electric Motor Car Clock. William Henderson Thompson, Memphis, Tenn., assignor to Thompson Electric Clock Co., Memphis, Tenn., a corporation of Tennessee. Filed June 6, 1911. Serial No. 631,637.

1,024,710—Sparking Igniter. Luther H. Wattles, Providence, R. I., assignor of one-half to Matie C. Messler, Pawtucket, R. I. Filed December 3, 1910. Serial No. 595,422.

1,024,711—Internal Combustion Engine. Harry Whidbourne, Plymouth, and John James Lishman, Salcombe, England. Filed August 24, 1911. Serial No. 645,820.

1,024,712—Engine Starter. William H. Williams, Statesboro, Ga. Filed January 30, 1912. Serial No. 674,311.

1,024,727—Lubricating System for Motors. Russel Huff, Detroit, Mich., assignor to Packard Motor Car Co., Detroit, Mich., a corporation of Michigan. Original application filed July 2, 1909. Serial No. 505,735. Divided and this application filed December 14, 1911. Serial No. 665,700.

1,024,746—Demountable Wheel Rim. Harry Hine Replogle, Montreal, Quebec, Canada. Filed April 22, 1910. Serial No. 556,983.

1,024,753—Resilient Tire. Jacob Thisson, Kane, Pa. Filed September 6, 1911. Serial No. 647,991.

1,024,817—Crankshaft. Horace L. Arnold, New York, N. Y. Filed October 7, 1909. Serial No. 521,506.

1,024,818—Variable Speed Gearing. John S. Barnes, Rockford, Ill., assignor to W. F. & John Barnes Co., Rockford, Ill., a corporation of Illinois. Filed October 30, 1911. Serial No. 657,670.

1,024,819—Spark Plug Holder and Spark Indicator. Edward Harron Been, Weymouth, Mass. Filed November 29, 1910. Serial No. 594,797.

1,024,834—Spark Plug. Louis J. Dirand, Torrington, Conn., assignor of one-half to Charles H. Carlin, Torrington, Conn. Filed November 20, 1907. Serial No. 402,998. Renewed August 30, 1911. Serial 646,846.

1,024,862—Internal Combustion Engine. Ernst Moewes, Marienfelde, near Berlin, and Alfred Vischer, Cannstatt, Germany, assignors to The Firm of Daimler Motorengesellschaft, Untertürkheim, near Stuttgart, Germany. Filed January 7, 1911. Serial No. 601,423.

1,024,871—Bearing Adjustable Means. Robert D. Valentine and Henry S. Battee, Minneapolis, Minn., assignors to Imperial Machinery Co., Minneapolis, Minn., a corporation. Filed October 5, 1911. Serial No. 653,081.

1,024,935—Portable Faultfinding Device for Electrical Ignition Apparatus. Samuel P. Hedges, Greenport, N. Y. Filed July 26, 1910. Serial No. 573,937.

1,024,973—Nut Lock. Henry M. Burrell, Pittsburgh, Pa. Filed October 11, 1911. Serial No. 654,034.

1,024,976—Resilient Tire for Vehicle Wheels. Alfred A. Curry, Bridgeport, Conn. Filed June 13, 1911. Serial No. 632,832.

1,025,038—Motor Car Seat. Ludwig Wilkening, Hanover, Germany. Filed February 15, 1910. Serial No. 543,999.

1,025,043—Clutch. Fred R. Allen, Providence, R. I., assignor to Eugene F. Bowen, Providence, R. I. Filed April 28, 1911. Serial No. 623,925.

1,025,047—Electric Gas Lighting and Extinguishing Apparatus. Josiah Samuel Benton, Johnstown, Pa., assignor to The Ideal Epworth Acetylene Co., Johnstown, Pa., a corporation of Pennsylvania. Filed July 16, 1910. Serial No. 572,240.

1,025,050—Ignition Tube. Alphonse Butsch, St. Lucia, British West Indies. Filed December 17, 1910. Serial No. 597,807.

1,025,051—Spring Wheel. Charles P. Carrick, Flint, Mich. Filed October 4, 1911. Serial No. 652,889.

1,025,072—Spring-cushioned Tire for Vehicle Wheels. William W. Lower, Tyrone, Pa. Filed January 2, 1912. Serial No. 669,045.

1,025,080—Spring Wheel. Charles Coughlin, Jersey City, N. J. Filed June 28, 1911. Serial No. 635,703.

1,025,100—Puncture Alarm. Frederick D. Schneider, Bedford, Ohio. Filed December 12, 1910. Serial No. 596,765.

1,025,105—Locking and Controlling Means for Turning Plugs. Fred Elliott Youngs, Detroit, Mich. Filed July 8, 1908. Serial No. 442,543.

Dow Solid Tire Construction—No. 1,024,189—Dated April 16; to Alexander Dow, New York, N. Y.—This patent relates to a solid rubber tire construction in which many canvas corrugations are arranged in layers throughout the tread of the tire to make it stronger and more durable, to prevent the tires from wearing away from the base fastening, and to eliminate the tendency of cuts to enlarge and pieces to fall away.

A cross section of the Dow tire is shown in Fig. 2, with seven corrugations of canvas fabric embodied in the rubber. Each layer of fabric is continuous around the circumference of the tire, and it will be noticed that the corrugations run diagonally with the circumference of the tire. Thus when distortion due to load on the tire takes place, the fabric can be stretched both laterally and circumferentially without damage. Even the distortion or stretching along the hollows and crests of the corrugations is provided for by the diagonal position of the corrugations, for the diagonal of the weave of the fabric is in line with the crests of the corrugations, thus giving elasticity in that direction.

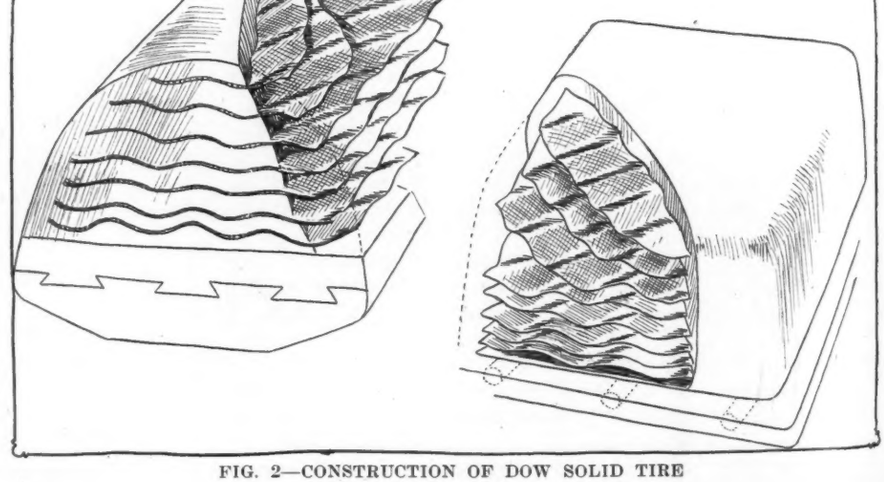


FIG. 2—CONSTRUCTION OF DOW SOLID TIRE

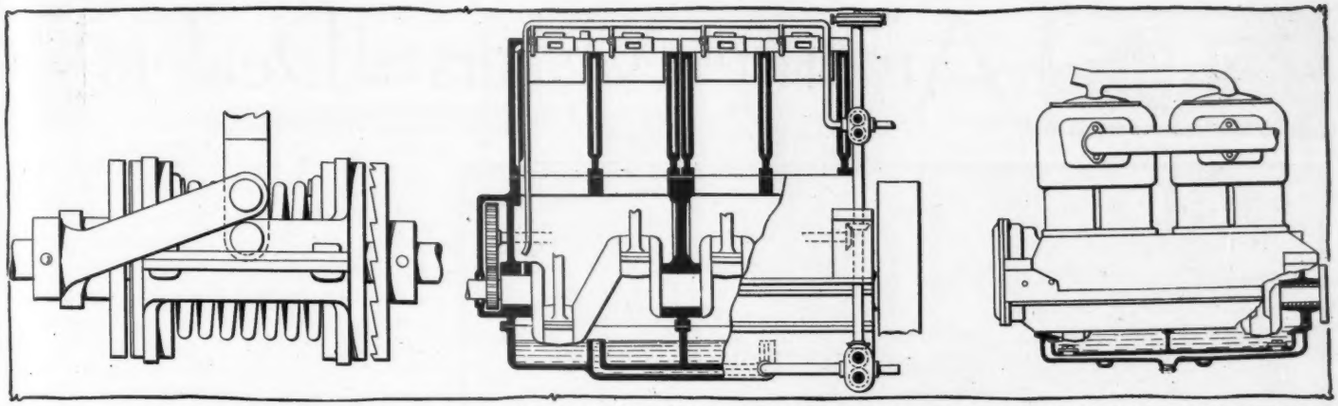


FIG. 3—WILLIAMS' ENGINE-STARTER FIG. 4—COFFIN'S ROTARY-VALVE MOTOR FIG. 5—PACKARD CRANKCASE CONSTRUCTION

Another advantage of the Dow tire construction is that the fabric distributes the stress due to traction and braking in an advantageous manner, carrying this stress over a greater portion of the rim attachment, lessening its stress per unit of surface and decreasing the liability of the rubber to rear away from the base fastening in ordinary road use.

Motor Car Spring Construction—No. 1,024,652, dated April 30; to Frederick Henry Royce, Derby, England—This patent pertains to a rear-spring construction for motor cars which resembles that introduced into this country a couple of years ago by the King Motor Car Co. It differs from the ordinary construction in that the spring is pivoted to the side-frame member near its middle point instead of being attached to the axle; and its forward end is secured to the side-frame member by means of the usual shackle device; whilst the rear end, instead of being secured to the end of the side-frame member, rests in a roller bearing on the axle of the vehicle.

Coffin Rotary-Valve Engine—No. 1,024,619, dated April 30; to Howard E. Coffin, Detroit, Mich.—As shown in Fig. 4, this patent covers a rotary-valve engine construction in which a disk valve opens ports in the head of the cylinder. The disk valve is mounted in a recess slightly larger than the bore of the cylinder; and it is rotated by means of a rotary stem which is journaled in the center of the detachable head of the cylinder. As illustrated, a large spur gear is secured to the upper portion of the valve stem, which is designed to mesh with a similar gear on a multi-cylinder engine, or to a driving mechanism communicating with the crankshaft of the motor.

Packard Crankcase Construction—No. 1,024,579, dated April 30; to Russell Huff, Detroit, Mich.—The crankcase construction to which this patent relates is shown in Fig. 5, and comprises a combination of a case having its lower portion divided longitudinally, the upper section having compartments adapted to hold oil for splash lubrication. There are openings in the remote ends of the splash compartments, through which the oil may overflow and drop into the sub-chamber below and thereby equalize the level of the oil therein; and means are provided to prevent oil from being splashed into the openings when they are above the surface of the oil in the crankcase.

Packard Lubricating System—No. 1,024,727, dated April 30; to Russell Huff, Detroit, Mich.—This patent relates to a circulating type of lubrication system, in which two rotary gear pumps are employed; one which draws oil from the base of the motor and forces it into a separate tank, and another pump driven from the same shaft and designed to draw oil from the tank and force it into the cylinder heads and into the base of the crank-chamber to maintain a proper splash level.

Factory Costs

AN EXHAUSTIVE reference book dealing with the subject of accounting systems is entitled "Factory Costs." The author, Frank E. Webner, is an expert in this line, having had many years of experience—20, he says—in installing cost systems and modernizing factory accounting methods. He presents his subject in a lucid manner and the book is worthy the consideration of accountants, works managers, and others interested in production costs.

Part 1 deals with the principles of cost accounting, discussing first the subject in general, with chapters on materials, labor, and expense. Methods and plans are considered next, being analyzed under the following classification: Estimate and test plan, the specific plan, the sold-hour plan, the list percentage plan, and the machine-hour plan.

Charting of these various methods and plans is outlined and illustrated in part VI, the diagrammatic illustrations presenting the "books and records used in the systems of cost finding they respectively represent. These are so arranged and connected as to show the function of each, the course of entries from one to another, and the general relation each bears to the others and to the general accounting system of the business as a whole."

Part VIII, comprising several chapters, contains over 200 forms showing the application of the systems discussed to various lines of business. Speaking of factory accounts and general accounts, the author says:

> Factory accounts should articulate with the general financial books of the concern. * * * No matter how far the departmental subdivision of an establishment is carried, or to what extent the principle of localizing the bookkeeping be pursued, the "intermeshing" of the various records and the proper representation of all accounts in the general ledger should be constantly kept in view.
>
> This interdependence of the various books of account is sometimes lacking. This is so because there are still factory accountants who do not realize the obvious and material advantages gained thereby. * * To establish an independent set of books for each separate department is a simple matter for any accountant. To devise a complete system of factory accounts, sound in principle, adequate in results, harmonious in operation, and all subsidiary to one central ledger, is a science as well as an art. Among modern cost accountants, whether in America or abroad, there is no disagreement as to the importance and necessity of having the cost records "interlock" with the financial records.

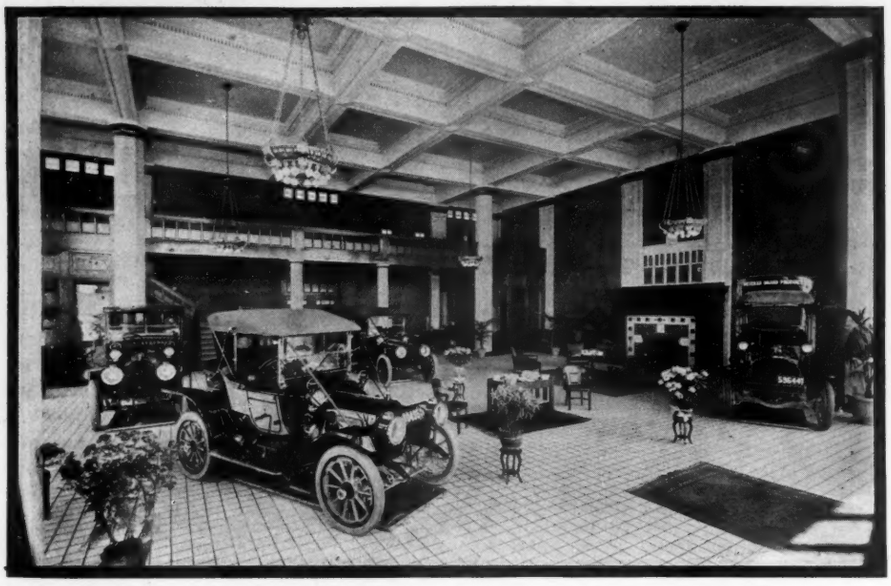
This book on cost accounting is published by the Ronald Press Co., New York.

The Motor Manual

In its fourteenth edition "The Motor Manual," published by the Temple Press, Ltd., London, deals in the opening chapter with the general principles of operation of the petrol, or gasoline, car, discussing the two and four-stroke types, the principles of carburation, and various motor fuels. The ignition system, the transmission system, the control system, etc., and various equipments are considered in order together with valuable information on troubles, their adjustments and remedies. The following paragraph on valve grinding will suffice to show the nature and scope of the manual:

> When the face of a valve becomes rough and pitted, causing loss of compression, it is advisable to regrind it with flour emery and oil; a little of this should be placed between the valve face and its seat, and the head worked briskly round—with a screw-driver placed in the slot, the use of a brace saves time—until the surfaces become smooth. It is advisable to lift the valve off its seat occasionally in grinding. The valve during grinding-in should not be turned around continually in one direction, as this tends to form rings or grooves on the surface. A backward and forward motion is best, the valve being frequently altered as to its position with the seating. Care should be taken to clean away any trace of emery from the valve passages to prevent it reaching the guides.

Among the Makers and Dealers



NEW SALESROOM OF MANDERY COMPANY IN ROCHESTER, N. Y.

WORMAN with Baker—H. A. Worman, formerly advertising manager of the National Carbon Co., of Cleveland, has become associated in the same capacity with the Baker Motor Vehicle Co., of Cleveland.

Building Case Foundry—The J. I. Case Threshing Machine Co. has started work on the erection of a $1,000,000 foundry plant adjoining its motor and car works at Lakeside, Racine, Wis. All of the company's foundry work will be done at the new plant, the present foundry departments being used for manufacturing purposes.

Rowe Plant May Move—Efforts are being made to move the plant of the Rowe Motor Co., Coatesville, Pa., to Lancaster and the present indications are that the removal will shortly be made. A number of prominent Lancaster business men are interested in the project, and several plants have been looked over in the northwestern part of the city.

Seattle a Shipping Point—Seattle's enviable position and importance as a point for shipping motor cars to the orient, Philippine islands and Australia is accentuated in the announcement by the Frank Waterhouse Co. that the Queen City is to be the Pacific coast terminal for the Australian Mail line. With the inauguration of the new schedule by the big transportation concern, Seattle will practically have a monopoly of the trans-pacific shipments of motor cars, which have been maintaining a steady growth and whose values reach far into the thousands each month. Every steamship that is sailing from Puget sound for the antipodes is carrying all the motor cars it can accommodate. On the steamship Strathgyle, which will sail from Everett, Wash., on May 15, there will be no fewer than sixty-three motor cars whose total value is estimated at $72,600, all destined for Australia.

Neil Van Dervoort Stricken—C. H. Van Dervoort, sales manager of the Moline Automobile Co. and one of the best known reliability drivers of the middle west, has been stricken with locomotor ataxia, and together with his wife has left for Colorado Springs, where he will spend several weeks for the benefit of his health.

Growth of Thomas Plant—The factory of the E. R. Thomas Motor Co., Buffalo, N. Y., has grown considerably since the early days of the industry. The brick structure in the foreground of the accompanying illustration originally embodied the complete works, offices included. It is now used exclusively for administration purposes. Later factory additions are built in reinforced concrete in unit construction. The plant now covers a large acreage on the Niagara river and has a capacity of 1,200 cars a year. Practically all parts of the Thomas cars are made in the factory.

POWELL SUPPLY CO., REPUBLIC TIRE AGENT IN OMAHA

Mandery in New Place—An accompanying illustration shows the main showroom and office of the J. J. Mandery Motor Car Co., 196-206 East avenue, Rochester, N. Y. On the mezzanine floor there are mirrors under each car so that visitors may view the mechanism of the vehicle. This structure covers an area of 32,000 square feet. Packard motor cars and trucks will be handled exclusively by the Mandery company.

Added to Henderson Staff—The Henderson Motor Car Co. is rapidly getting its force together. F. E. Wilson, until May 1 sales manager for the Marion Sales Co., has been appointed to a similar position with the Henderson concern. C. K. Share, formerly in the office of the Marion county treasurer, is to be treasurer of the company. It is also announced that Lucius S. French is to became identified with the company as a stockholder and officer on May 15.

Illinois Dealers Meet—At the monthly meeting of the officers and directors of the Automobile Dealers' Association of Illinois, held at Springfield, sixteen new members were reported, giving the total membership a boost past the hundred mark. The sixteen new members represented thirteen additional cities of the state. It was voted to send circular leters to each candidate for senator and representative nominated at the recent primaries, asking them to state their position concerning the disposition of the motor license money now in the treasury and whether they are in favor of using the money for two or three main highways or dividing it up by counties.

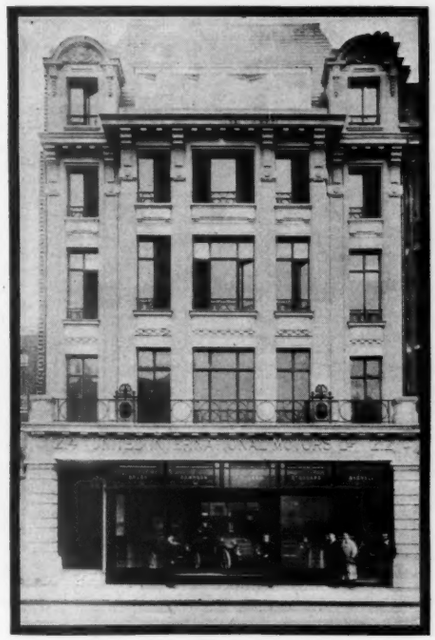
Johns-Manville Moves—The executive offices and New York showrooms of the H. W. Johns-Manville Co., manufacturer of asbestos, magnesia and electrical supplies, have been moved to the new twelve-story H. W. Johns-Manville building, Madison avenue and Forty-first street, New York city. This move marks the fifty-fourth anniversary of the company, which now has factories located in Brooklyn, N. Y.; Milwaukee, Wis.; West Milwaukee, Wis.; Hartford, Conn.; Nashua, N. H.; Lockport, N. Y., and Newark, N. J., with an asphalt refinery at South Amboy, N. J.; and asbestos mines at Danville in the province of Quebec, Canada. In the new quarters the company will have the distinction of being one of the few manufacturing concerns which occupy an entire twelve-story office building. In its entirety the company now occupies over

2,657,160 square feet of floor space or about 61 acres. The employes number approximately 5,000 and there are about 425 salesmen.

Death of Marmon Man—A. L. Swigart, special road expert for the Nordyke & Marmon Co., Indianapolis, died in Los Angeles, Cal., on April 27, where he had been ill for 3 weeks. The body was returned to Indianapolis for burial. Mr. Swigart assisted Marmon representatives in getting their cars ready for delivery. He had been with the company since 1905.

To Handle the Isotta—Isotta-Fraschini cars will be handled in future throughout the United States by the Isotta-Fraschini Motors Co., recently incorporated in New York. The new corporation will import the chassis direct from the Milan, Italy, factory. Headquarters will be maintained in New York. The following have been elected officers: G. M. Heckscher, president; G. E. Parks, vice-president; G. N. Thurber, second vice-president and general manager, and C. B. Jaqua, secretary-treasurer. The bulk of the body work will be done as heretofore by J. M. Quinby & Co., who represented the factory in America prior to the accession of the new importing house.

Atlanta's Trade Strength—With the Abbott Motor Co. already doing business in Atlanta, Ga., with A. L. Bennett, sales manager, in temporary charge, and with C. M. Dow there in the interests of the Everitt Motor Car Co., Atlanta will soon have fourteen southeastern branches. The other cars represented with southeastern branches in Atlanta are R. C. H., Ford, Mitchell, United States Motor Co.'s line, Locomobile, White, Buick, E-M-F, Flanders, Oakland, Velie, J. I. Case and International Harvester Co. In addition eight tire companies are represented with branch houses here. They sell the Firestone, Diamond, Fisk, Goodyear, Goodrich, Ajax, Michelin and U. S. Tire Co's line. Other related companies which have branches



NEW EUROPEAN HEADQUARTERS OF UNITED STATES MOTOR CO., LONDON

there are Prest-O-Lite, Searchlight, Warner Autometer Co., Vesta Electric Co. and Bowser Tank Co. In addition to the new branches mentioned above it is reported that the Krit will soon be handled from Atlanta by a factory branch or distributing house and that the Hupmobile will also establish a branch house there.

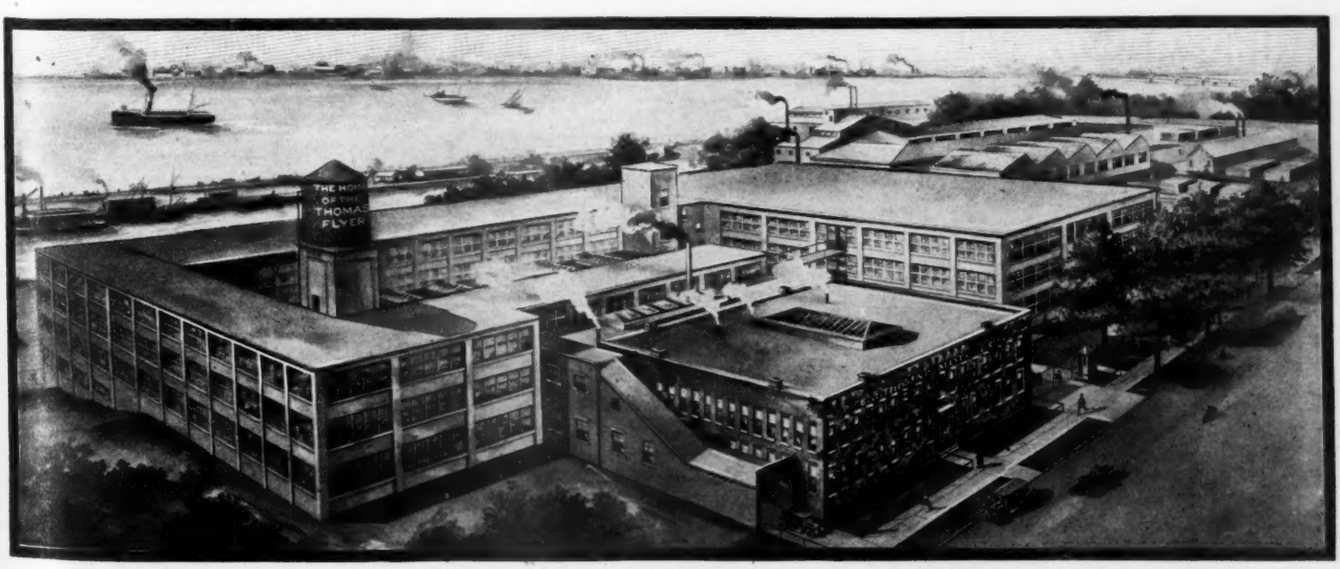
New Foundry Company—W. Robertson has severed his connection with the Frontier Iron Works, of Buffalo, and has organized a new company under the laws of the state of New York, capitalized at $15,000, under the name of W. Robertson Machine and Foundry Co. The officers are: W. Robertson, president and manager; T. J. Reed, vice-president; F. H. Keil ,secretary; F. M. Robertson, treasurer. The company will manufacture machine tool specialties, which includes a complete line of power hack saws for all kinds of metal-cutting, special drilling machine, and also manufacture to order gray iron pistons. The company is located at 32 Greenwood place.

Abresch Will Probated—The estate of Charles Abresch, founder and president of the Charles Abresch Co., Milwaukee, who died last week, has been appraised at $225,000, of which amount $150,000 is personal property.

St. Paul Show Made Money—The St. Paul Motor Car Dealers' Association reports a profit on the second annual show last winter and has reserved the Auditorium for the third show the third week of next February. After paying bills the association voted $1,000 to the Automobile Club of St. Paul, as its percentage.

Lauth-Juergens Building—The contract for the erection of the new Lauth-Juergens factory building west of Fremont, O., has been awarded. The new building will be 60 by 200 feet and will be of saw-toothed roof construction. A vault measuring 19 by 32 feet to be used as a pattern room will also be constructed and both buildings will be joined over a courtyard. The dimensions of the roof will be 90 by 100 feet. The main building will be one story in height and similar to the present structure. The vault will be two stories high.

Stephen Bull Retires—Stephen Bull, one of the founders of the vast J. I. Case Threshing Machine Co. interests at Racine, Wis., has resigned as a member of the board of directors in order to spend his declining years without business cares. Stephen Bull II, grandson of the founder, was elected to succeed him as a director. Mr. Bull, with Jerome I. Case, M. B. Erskine and Robert Baker, founded the Case business nearly 60 years ago. He observed his ninetieth birthday in March. Mr. Bull was active in the management of the company until he resigned on May 1. His son, Frand K. Bull, is president of the Case company, having succeeded his father in 1897.



PLANT OF THE E. R. THOMAS MOTOR CO. IN BUFFALO NOW USED FOR ADMINISTRATION PURPOSES

Developement Briefs

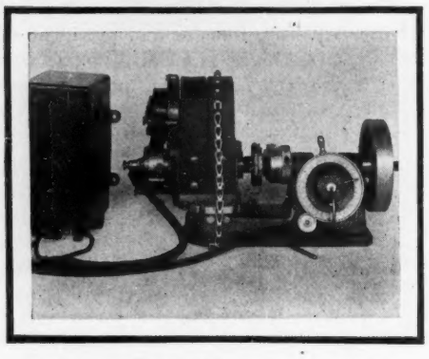


FIG. 1—BUTLER MAGNETO TESTER

Bosch Mechanical Oiler—New Instrument For Testing Ignition—Post Tire Armor—Steam Vulcanizer For Small Garage

Bosch Company in Lubrication Field

ONE of the latest products of the Bosch Magneto Co., New York, is the Bosch oiler. It is constructed along original lines and is designed to assure accurate and positive feed of oil with uniform operation. It is quite simple in construction, each feed of the oiler constituting an independent unit and having but two moving parts, a cylindrical plunger and a cylindrical piston valve. Fig. 5 shows the interior of the lubricator.

The feed units are grouped around a central member which consists of a shaft S carrying two disks D and D1, having an irregular form and setting at various angles to the vertical shaft. The upper ends of the plungers P and P, and of the piston valve P1 grip loosely the circumference of one or the other of the two disks or cams and by the rotation of the latter the plungers are given a reciprocating vertical movement. The disks are set in such a relation that the piston valve is given a certain lead over the plunger. Aside from the central driving member, its worm-gear drive and the piston valve, there are no moving parts.

The quantity of oil fed at each stroke of the plunger is adjusted by means of a single screw and aside from this adjustment when fitting the oiler no attention is required. If the oiler is arranged with a sight feed, the pump is given a double stroke which results in forcing one charge of oil to the bearings and the following charge to the sight feed. Consequently, the sight-feed glass is relieved from all pressure and should it become accidentally broken this would not interfere with the regular feed to the bearings as might be the case otherwise, if the glass should happen to be broken or the sight feed stopped up for the time being.

Wheeler Steam Vulcanizer

Fig. 4 illustrates a simple steam vulcanizer for garage or repairshop use which is adapted for gasoline as fuel. It is stated that steam is generated in the vulcanizer in from 7 to 10 minutes. The steam boiler is made of cast iron and tested to stand a pressure of 250 pounds to the square inch. The vulcanizing plate is 16 by 4½ inches in size and can handle four inner tubes every 15 minutes, or the same number of cuts or sand blisters in casing. The same design is furnished for use when natural or artificial gas is to be used as fuel. It is made by the Wheeler Steam Vulcanizer Co., Wheeling, W. Va.

Post Tire Armors

To serve the dual purpose of providing a steel tread which will take the wear of solid truck tires and at the same time provide a good traction surface on the tread there has been brought out the Post tire armor, illustrated in Fig. 3. As arranged for dual tires the armor consists of a series of steel plates arranged to go clear across the two treads with an indentation that fits the space between the two treads. These are held in place by a band passing around the circumference of the wheel and resting in the depression between the treads. It is stated that the armors reduce heating and reduce the wave action so destructive to solid tires and at the same time prevent surface wear on the rubber. These are the product of the Post Tire Armor Co., Cleveland, O.

FIG. 3—POST TIRE ARMOR

Butler Magneto Tester

Testing ignition apparatus is one of the most important and at the same time one of the most difficult operations in connection with gasoline engines. As a means for testing ignition devices of all kinds there has been produced by the Butler Mfg. Co., Carthage, Ind., a device called the Butler magneto tester. It is designed to enable the average mechanic to properly diagnose ignition troubles. It is not intended to be a cure, but only a method of pointing out the difficulty and at the same time suggesting the remedy. The tester is illustrated in Fig. 1 with a magneto and spark coil attached for test. The device itself consists of a base provided with a headstock supporting a longitudinal shaft provided with a handle and small flywheel. A chuck is provided by which the shaft can be connected to the shaft of a magneto or other sparking device for testing. A table is provided for mounting the magneto and it is adjustable in height by a threaded supporting stem screwed into a socket and can be clamped in any position by means of a set-screw. The edge of the table is slotted so that the magneto or other instrument may be clamped to it by means of a chain, as illustrated in Fig. 1. Attached to the headstock there is a dial graduated to 360 degrees. This forms one electrode, the other one being operated by a pointer adjustable by means of an insulated handle. The latter electrode is driven with spiral gears from the shaft and is insulated therefrom by a disk which carries a finger that moves over the dial but does not touch it. The inner end of the finger electrode is connected with a metal button in

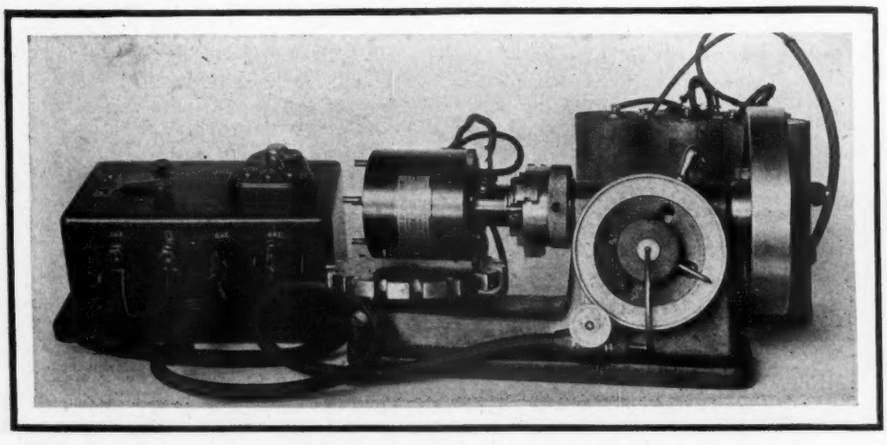


FIG. 2—BUTLER MACHINE TESTING SPARKING DEVICE

Novelties for Motoring

Outfit For Painting Car at Home—Graphite Lubricants—Magneto Ignition For Self-Starters—Ford Lighting Set

FIG. 4— WHEELER STEAM VULCANIZER

the face of the insulating disk. When a magneto is under test the sparks produced by the magneto upon rotation of the shaft will take place between the electrode finger and the metal button on the insulating disk and the volume of the spark will be shown by the distance the spark follows the finger as it moves around the dial. The range of advance and retard may be measured by noting the number of degrees on the dial through which the spark takes place. The arrangement of the tester for examining a uni-sparker system is illustrated in Fig. 2, while in Fig. 6 is shown a method of testing a magneto already in place on a motor.

Graphite Lubricants

To supply lubricating oils and greases in which its deflocculated graphite is mixed in the proper proportions the International Acheson Graphite Co., Niagara Falls, N. Y., is putting out three different grades. One of these, Oildag, consists of deflocculated graphite diffused in cylinder oil, another is Gredag consisting of disintegrated graphite in combination with grease, and the last is Aquadag, which is deflocculated graphite diffused in water. It is stated that deflocculated graphite is in a molecular condition and remains in perfect suspension and cannot be obtained in powdered form. Aquadag is employed in steam engines as it affords an opportunity to lubricate the steam cylinders without the difficulty so often encountered of carrying oil into the boilers.

Painting Cars at Home

For the benefit of those amateurs who wish to repaint their own cars the Arsenal Varnish Co., Rock Island, Ill., has developed a system by which the materials and directions are supplied for doing a creditable job at little expense of money or labor. Three different outfits are offered, one for small runabouts, another for small touring cars and the third for larger cars. The materials are supplied ready mixed and it is stated that a few hours on 3 different days is all the time required. The first and second coats it is claimed, dry in 24 hours each, and the last dries free from dust in the same time but should stand 1 week before the car is used. The car need not be laid up for repainting more than 2 weeks. Special outfits for enameling the fenders and hoods of cars and for repainting the chassis alone or for revarnishing the car are supplied where complete repainting is not needed or time will not permit.

Self-Starter Magneto Outfit

One of the chief talking points of the Mea magneto has been the fact that it has never been necessary to install batteries in connection with the magneto to insure easy starting or running on low speed. However, the recent demand for self-starting devices on motors in which acetylene gas or gasoline is employed has made it necessary that batteries be used in connection with the magneto owing to the fact that a spark must be created without using the crank. To fulfill this demand, Marburg Bros. Inc., New York, importers of the Mea magneto, has put upon the market a dual Mea magneto equipment. This consists of a combined coil and switch and a magneto which in the main does not differ from the independent type but which is provided with a battery-circuit breaker. The connections are such that the high-tension distributer is connected to the magneto armature whenever the magneto fires and connected with the coil whenever the coil is operated. The coil is of two types; one, a vibrator type which supplies a shower of sparks for every firing stroke and the other a non-vibrating type supplying one spark for the firing stroke but provided with an attachment for supplying a shower of sparks for starting purposes. Both coils are of the horizontal dashboard design. The magnetos in the two types of equipment differ only in the circuit breaker. With the vibrator type of coil this breaker closes when the spark is desired, while with the single-spark type the breaker is normally closed and opened only at the moment of firing.

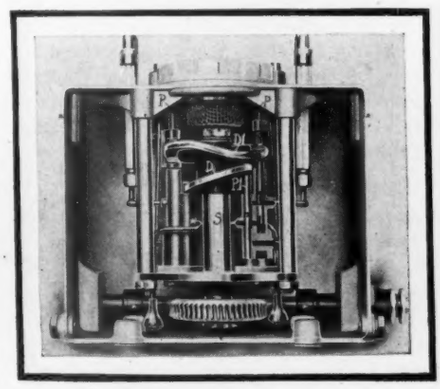


FIG. 5—BOSCH OILER

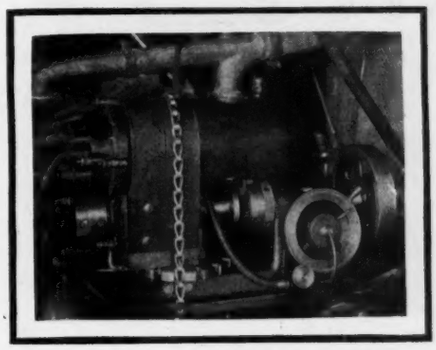


FIG. 6—BUTLER TESTER ON MOTOR

No push button or special device for starting is required. In order to start the motor from the seat, the switch is moved to the battery position which automatically supplies a spark from battery to the cylinder. The peculiar method of timing which is a characteristic of the Mea magneto is said to give a larger range of firing than is usual with dual systems. The time of ignition is governed by moving the distributor together with the timing device so that a spark produced with the motor standing still will always reach the right cylinder no matter in what position the motor has been stopped.

Ford Lighting Outfit

The demand for outfits by which electric headlights can be supplied with current from the magneto on the Ford model T has resulted in the appearance of another headlight outfit manufactured by R. C. Hull Electric Co., Cleveland, O. This includes a pair of 9-inch bullet-shaped headlights with parabolic reflectors, tungsten bulbs, switch, wires with soldered terminals and clamps for fastening wires to the car. For converting gas lamps to electric for this outfit are supplied parabolic reflectors which fit the gas headlights where special lamps are not desired.

Heelplate Preserves Matting

One of the newest accessories to make its appearance on the counters of dealers and supply men is a heelplate designed to prevent the wearing of unsightly holes in the floor covering back of the pedals, or to cover up any holes that are already there. This plate is made of special, heavy, tough aluminum, 6 by 10 inches in size, with ¼-inch pyramids to prevent slipping. It is the product of the Metallic Automobile Matting Co., Rochester, N. Y.

Brief Business Announcements

New Agencies Appointed by Car and Truck Manufacturers

PLEASURE CARS

Town	Agent	Make of Car
Boston, Mass.	Burke and Richards	Michigan
Des Moines, Ia.	Pullman Motor Sales Co.	Pullman
Frederick, Md.	T. Irving Miller Co.	Krit
Galveston, Tex.	Texas Garage	Pullman
Hagerstown, Md.	W. W. Barr	Krit
Lincoln, Neb.	Means Auto Co.	Paige-Detroit
Louisville, Ky.	Louisville Lozier Co.	Pullman
Louisville, Ky.	Clark Motor Car Co.	Reo
Madisonville, O.	U. G. Blaney	Franklin
Manila, P. I.	E. C. McCullough	Alco
Marion, O.	C. C. Stoltz	Stevens-Duryea
Minneapolis, Minn.	A. F. Chase & Co.	Empire
Nashville, Tenn.	Southern States Sales Co.	King
Philadelphia, Pa.	La Roche Brothers	Detroiter
Providence, R. I.	Pilot Automobile Co.	Pilot
Scranton, Pa.	L. M. and C. A. Connell	Alco
St. Paul, Minn.	White Bear Auto Co.	McFarlan
Toledo, O.	L. L. Law	Jackson
Toledo, O.	Crist Motor Sales Co.	Empire
York, Pa.	Snyder Auto Co.	Studebaker

MOTOR TRUCKS

Town	Agent	Make of Car
Boston, Mass.	William S. Taylor	Lansden
Dayton, O.	Standard Motor Car Co.	Lippard-Stewart
Kansas City, Mo.	H. E. Wilcox Motor Car Co.	Wilcox
Minneapolis, Minn.	Pence Automobile Co.	Federal
Syracuse, N. Y.	W. H. Bissell	I. H. C.
Winnipeg, Can.	W. F. Jackson	Poss

MEDFORD, Pa.—The Teel Mfg. Co. denies it will handle any make of trucks but its own.

Buffalo, N. Y.—The Selleck Auto Equipment Co. will open a branch office in the Burrell building, Main and Goodrich streets.

Janesville, Wis.—J. A. Strimple, agent for the Mitchell, has taken over the Grover Horn garage on North River street and will conduct a garage.

Auburn, Ind.—The W. H. McIntyre Co. of Auburn, Ind., will shortly enter the Seattle field. H. H. Thorpe, western sales manager, expects to place an agent in the Seattle field in the near future.

Salt Lake, Utah—The Campbell Auto Co., Utah distributor of the Michigan and Premier, has just signed a long-time lease for new quarters on Fourth South street.

Montpelier, Idaho—Make & Young of Kemerer, Wyo., announce they will open a garage and general salesroom in this city at once. Make & Young will operate the Montpelier store as a branch house.

Minneapolis, Minn.—The Jackson Motor Car Co. branch for the northwest has taken possession of a new building at 1528 Hennepin avenue, with large ground floor space, store room and service department garage.

Chicago—The V. W. Bonham Sales Co., formerly located at 1407 Michigan avenue, has removed to 125 South Center avenue, at which point it will carry in stock a line of Judd & Leland Mfg. Co.'s pumps and accessories.

Springfield, Ill.—The Springfield Auto Sales Co. will open the doors of its new garage on May 12, and for the week of May 13-18 will hold the first show ever held in central Illinois. All models of the Studebaker, E-M-F 30 and Flanders 20, Detroit electric, Michigan, Premier, Rambler and Moon lines will be shown. Several tire and accessory houses will be represented at the show.

York, Pa.—The North York Auto Repair Shop has been opened by R. E. Jacoby at 939 North George street.

Minneapolis, Minn.—The Federal Rubber Mfg. Co. has opened a northwestern branch at 1331 Hennepin avenue in charge of W. F. Bigelow.

Easton, Pa.—Fred G. Schenkel has associated himself with the sales force of the Treadwell Engineering Co. He formerly was connected with the Hess Steel Casting Co.

Detroit, Mich.—Roscoe C. Chase, formerly associated with the advertising department of the Thomas B. Jeffery Co., now is a member of the advertising department of the Packard Motor Car Co.

Holland, Mich.—The capacity of the City garage will be doubled by the erection of an addition 55 by 132 feet. The enlarged garage will have entrances on both Eighth street and Columbia avenue.

Victoria, B. C.—The Dunlop Tire Rubber Goods Co., Ltd., has opened a branch office of the company in Victoria. The business in the past has been handled through J. L. Beckwith & Co.

Portland, Ore.—C. G. Arnold, who was with the Pope-Hartford agency in New York city for some years, has secured the state of Oregon agency for the Oakland motor cars, with headquarters in Portland. He will open under the name of the Pacific Motors Co.

Salt Lake City, Utah—The Salt Lake Automobile Co. has taken over the garage, show rooms and complete equipment of the Sharman Automobile Co. The Salt Lake Co. is a new concern organized a few weeks ago to handle the Franklin car for this territory. The Sharman company is the oldest car firm in the state and at the present time handles the Cadillac exclusively. It is rumored Sharman will build a new garage and continue in business with the Cadillac car.

Indianapolis, Ind.—The Kelly Motor Truck Co. has established a factory sales branch and service station at 9 East Pratt street.

Racine, Wis.—The Economy Spring Co. has started work on the erection of a new plant on Wisconsin street, from Third to Fourth streets.

Grand Forks, N. D.—J. W. Lyons, Franklin dealer in this territory, is building a new garage, 100 by 500 feet, with a machine shop 50 by 40 feet.

Montreal—The Leap Wheel Co., of Canada, Ltd., has been incorporated with a capital of $500,000 to deal in and manufacture motor cars, etc.

Boston, Mass.—The Boston salesrooms of the Kilgore Mfg. Co., maker of the Kilgore shock absorbers, has been moved from Copley square to 883 Boylston street.

Columbus, O.—The Twyman Motor Car Co. has opened a branch at 224 North Main street, Dayton, O. This branch will handle local business and also will act as branch distributor in Montgomery and surrounding counties.

Grand Rapids, Mich.—David C. Riekse has disposed of his interest in the local Cutting car agency to his cousin, Henry J. Riekse, who for some time has been associated with him. Henry Riekse will continue the agency at the old location, 11 Island avenue, N. E., under the name of the Riekse Automobile Co.

Kansas City, Mo.—The Standard Engineering Co. has moved to 1116-18 East Fifteenth street. It is incorporated for $10,000, with E. A. Barnes, president; W. C. McDonald, vice-president and general manager; S. B. Rice, secretary and treasurer. It is handling some lines of supplies and accessories as manufacturers' agent, and is putting out a line of small engine gen-

erator storage battery sets for garage lighting and power purposes and for charging storage batteries.

Menominee, Mich.—D. F. Poyer & Co. purchased the Andrew Gram building and will establish a factory for the manufacture of trucks.

Richmond, Va.—Lee A. Folger, manager of the Gordon Motor Co., has resigned that position to accept the management of the interests of a factory in a city further south.

Washington, D. C.—The Cook & Stoddard Co., agent for the Pierce-Arrow, Cadillac, and Baker electric, has taken possession of its new building at 1138-40 Connecticut avenue.

Los Angeles, Cal.—The Coleman & Bontel Co., of Los Angeles, has completed negotiations for a new concrete building, which will be four stories in height and modern in every respect.

Atlanta, Ga.—The Sigma Electric Co., headed by C. P. Poole, has bought out the business of S. A. Corker and hereafter will handle the Haynes, Imperial and Matheson in this territory.

Milwaukee, Wis.—The Mitchell Automobile Co. of Milwaukee, branch of the Mitchell-Lewis Motor Co. of Racine, Wis., is about to award contracts for the construction of a large service building at 528-532 Broadway, using the present building as a nucleus.

New York—Announcement has just been made of the organization and incorporation of the Lippard-Stewart Motor Sales Co., of New York, which will handle the Lippard-Stewart commercial cars in New York city. The organization is headed by T. W. Pelham, general counsel for the Gillette Safety Razor Co. The new concern opened for business May 1 at 1700 Broadway.

Washington, D. C.—The Champan-Love Auto Co., recently appointed agent for the King, has leased the building at 1312 Fourteenth street, N. W., formerly occupied by Wine & Benson.

Columbus, O.—The Metal Welding and Brazing Co. is the name of a new concern which has opened a shop at 75 East Mound street for the purpose of repairing cars. The concern makes a specialty of welding cylinders and crankcases.

Minneapolis, Minn.—The Kemp Brothers Automobile Co., 1518 Hennepin avenue, will erect a $50,000 electric charging and service station at 1917-1923 Hennepin avenue to be ready August 1. The building will be one story, of tapestry brick.

Milwaukee, Wis.—John McDonald, for many years chief purchasing agent of Gimbel Brothers' Milwaukee department store, has resigned to become sales manager of the Kopmeier Motor Car Co., of Milwaukee, representing the Fiat, Chalmers and Detroit electric.

Portland, Ore.—Two new companies were launched in Portland Ore., the past week. They are the Pacific Motors Co. and the Gerlinger Motors Co. The former will handle the Oakland and the latter will take over the Pathfinder pleasure car and the Little Giant truck.

Toledo, O.—The Buick will again be represented in Toledo, the McLeary Engineer Co. having been appointed distributing agent for this line. W. A. Cavanaugh, formerly with the Maxwell, will have charge of the Buick sales department of the McLeary company. The McLeary company recently moved to Superior and Jackson streets, where it has 40,000 feet of floor space.

St. Louis, Mo.—R. W. Leach, formerly of Chicago, has been appointed manager of the Woods electric branch in St. Louis.

Vancouver, B. C.—I. B. Hurd, Vancouver manager for the Rambler, announces that his firm intends to establish a branch factory in Vancouver shortly.

Minneapolis, Minn.—The Chase Motor Truck Sales Co. has opened a showroom and garage at 157 Hennepin avenue, where it will display the Chase truck.

Cambridge, Mass.—W. S. Sanderman has again embarked in the garage business, having opened a place at 59 Boylston street, Cambridge, near Harvard college.

Marinette, Wis.—The partnership of Myron R. Churchill and Harold E. Scott, doing business as the United Car Sales Co., 1351 Main street, Marinette, Wis., has been dissolved. Myron R. Churchill will continue the business and assumes all liabilities and accounts.

Salt Lake, Utah—The Monarch Motor Car Co. has opened for business. A temporary show room is located at 139 East First South, but plans are now out for a new building for the company. A. C. Lee comes from Dallas, Texas, to take the position of sales manager. The Stearns is handled.

Chicago—The Kissel Motor Car Co. has leased the large four-story building at the corner of Twenty-sixth and Wabash avenue. This building is 120 by 199 in dimension and will provide nearly 100,000 square feet of floor space. The new Kisselkar building will be equipped as a service building.

Recent Incorporations

Albany, N. Y.—Motordom Publishing Co., capital stock, $50,000; incorporators, A. J. Deer, R. S. Ross, H. Martin.

Alexandria, Va.—American Pneumatic Starter Co.; to manufacture starters; incorporators, C. A. Douglas, G. L. Baker, E. L. Leckie.

Bowling Green, O.—Star Machinery and Garage Co., capital stock, $5,000; general repair and supply business; incorporators, E. H. McKnight, J. L. Smith, M. T. Dilts, I. M. McKnight, A. N. McKnight.

Brooklyn, N. Y.—Republic Motors Co., capital stock, $2,000; to manufacture motor cars, engines, etc.; incorporators, S. G. Frere, E. J. Ellenwood, W. J. Maloney.

Buffalo, N. Y.—Buffalo Electric Vehicle Co., capital stock, $700,000; D. J. Dark, president; A. A. Landon, vice president.

Chicago—Packer Auto Specialty Co., capital stock, $2,500; incorporators, William Bangs, Laird Bell, W. C. Bayden.

Chicago—Pullman Motor Sales Co., capital stock, $2,500; to manufacture motor cars and parts; incorporators, L. A. Cohen, C. Aaron, H. W. Bissell.

Cleveland, O.—Cleveland Motor Truck Mfg. Co., capital stock, $250,000.

Columbus, O.—Columbus Motordrome Co., capital stock, $20,000; to promote races; incorporators, W. H. Snyder, G. H. Baugham, P. A. Vogel, C. E. Barr, C. E. Webster, A. C. Edwards.

Des Moines, Ia.—Des Moines Rambler Co., capital stock, $25,000; directors, J. Given Chase, H. S. Chase, E. Scripps.

Dover, Del.—Gulf Coast Auto Supply Co., capital stock, $20,000; to manufacture and deal in motor cars; incorporators, W. F. P. Lofland.

Kenedy, Tex.—Kenedy Auto Supply Co., capital stock, $2,000; incorporators, L. Pullin, N. A. Newman, V. A. Smith.

Louisville, Ky.—Louisville Lozier Co., capital stock, $20,000; incorporators, H. Lothrop, H. T. Martin, D. T. Marantette.

Lynchburg, Va.—W. J. Merchant Automobile Co., capital stock, $1,000 to $5,000; motor car business; incorporators, W. J. Merchant, C. A. Harrison, J. H. Bugg.

Muncie, Ind.—Muncie Automobile Co., capital stock, $15,000; directors, M. T. Hanley, J. J. McInnis, F. A. Hanley.

Nelsonville, O.—Nelsonville Central Delivery Co., capital stock, $2,500; general drayage; incorporators, G. E. Johnson, D. F. Shafer, J. Fischer, L. O. Wadley, C. D. Shafer.

New York—B. F. Goodrich Co., capital stock, $45,000,000; to manufacture rubber goods; incorporators, B. G. Work, C. B. Raymond, D. M. Goodrich.

New York—L. A. W. Carburetor Co., capital stock, $10,000; to manufacture motor car accessories; incorporators, N. Leinau, S. Heineman, H. A. Watkins.

New York—Field Electric Bus Co., capital stock, $10,000; to manufacture electric cabs; incorporators, W. Eastman, C. J. Field, B. Osterhout.

New York—Hoopeston Automobile Co., capital stock, $25,000; to deal in motor cars and accessories; incorporators, W. N. Ferguson, F. W. Wallace, J. H. Norris.

New York—Automobile Fault Finder and Anti-Forgery Electric Pen Co., capital stock, $50,000; to manufacture motor car accessories; incorporators, P. Henry Conty, D. D. Ghadiali, Harry Weinberger.

New York—Diamond Motor Car Co., capital stock $10,000; incorporators, C. W. Rundlett, C. W. Jaycox, F. Davis.

New York—Magneto-Dynamotor Co., capital stock, $100,000; to manufacture magnetos, dynamos and accessories; incorporators, G. L. Henry, F. B. Moody, B. T. Moody.

New York—Garden Taxi Cab Co., capital stock, $15,000; to deal in motor cars; incorporators, R. Green, G. R. Schulze, J. J. Harvey.

New York—Knickerbocker Motor Car Sales Co., capital stock, $10,000; incorporators, B. Harris, R. L. Noah, W. L. Robertson.

New York—Hamilton Storage and Terminal Co., capital stock, $75,000; trucking business; incorporators, C. V. Pallister, F. R. Greene, W. J. Doyle, Jr.

New York—Dual Wheel Co., capital stock, $300,000; to manufacture wheels and other parts of motor trucks; incorporators, F. B. Cochran, C. W. Jewell.

Pittsburg, Pa.—G. A. Schnabel and Sons Co., manufacture and repair motor cars, etc.; incorporators, G. A. Schnabel and C. F. Tiers.

Quaker City, O.—W. H. Hartley Sons Co., capital stock, $25,000; to manufacture agricultural implements and vehicles; incorporators, M. L. Hartley, H. S. Hartley, O. G. Hartley, G. C. Hartley, L. H. Lingo, H. H. Bundy.

Racine, Wis.—Sieverkropp Engine Co., capital stock, $100,000; incorporators, H. R. Sieverkropp, A. F. Sieverkropp, F. P. Sax.

Shippensburg, Pa.—Shippensburg Auto and Hardware Co., capital stock, $25,000.

St. Louis, Mo.—Dilke Garage Co., capital stock, $2,000; to deal in motor cars; incorporators, C. H. Smith, Jr., C. K. Huthsing, S. Broadbent.

Wilmington, Del.—Never Puncture Tube and Tire Co., capital stock, $1,500,000.

Worcester, Mass.—Worcester Wind Motor Co., capital stock, $30,000; incorporators, Victor J. Johnson, F. L. Erickson, E. C. Lindberg, C. J. Johnson.

The Motor Car Repair Shop

FIG. 1—LINING-UP TOOL

Treatment for Misalignment of Front Wheels—Making an Acid Dauber—Washing Tires

UNUSUAL tire wear and increased difficulty in operating the steering wheel of a motor car, are two common troubles experienced by the motorist, which may be due to misalignment of the front wheels. It is claimed that in order that the front wheels of a motor car may run truly parallel, the tie-rod between the steering arms of the front-wheel spindles generally should be adjusted so that the extreme front of the wheels are from ¼ to ⅜ inch closer together than the extreme rear portions. In other words, the distance between the insides of the wheel felloes at a point on a horizontal level with the center of the wheel hub, should be from ¼ to ⅜ inch greater behind than in front.

This convergence of the front wheels toward the front is termed foregather; and in Fig. 1 is shown a simple tool used in the Thomas agency's repairshop, Chicago, for testing the foregather of the front wheels of motor cars that are brought in for repair, adjustment or inspection. It consists of two rods, each having one end formed into a guide through which the rod portions may pass so as to hold each other in sliding relation. A thumb screw is threaded into one of these guides to secure the rods in any desired relative position; and the opposite end of this rod is bent at right angles to form a short hook. To use this tool the operator has but to hook the one rod against the outside of the felloe of the farther wheel, slide the other rod outward until the point of it touches inside of the felloe of the opposite wheel, then tighten the set screw. The test should be made in front of the axle first; then by placing the tool at a similar height behind the axle, one should be able to see at a glance whether or not the felloes are the required distance farther apart behind.

Soldering Acid Bottle

In Fig. 2, is shown a bottle suitable for holding the acid used by the amateur or professional motor car repairman. It contains a dauber made from a piece of wire and a strip of cloth. Since there are many workmen who are required to use these articles in their work, and who in many cases are at much inconvenience because of the necessity of using an ordinary stick of wood for applying the acid, etc., a simple method of making a very handy dauber is shown. The strip of cloth C, say about ¾ inch wide, is wrapped around the wire near one end. A slit T then is cut through the cloth to the depth of the wire, this slit extending up about ¼ inch from the bottom; and it can perhaps best be cut by starting the point of the knife K as indicated in the illustration and drawing it downward. The end of the wire is then bent up through this slit and hammered down flat against the cloth to keep it from unwrapping.

A few words in connection with this on tinning and soldering may be appreciated by some of the readers of Motor Age whose experience in this line of work has been somewhat discouraging. In soldering any two parts together, it is most essential that both contact surfaces be absolutely clean and bright. The hands

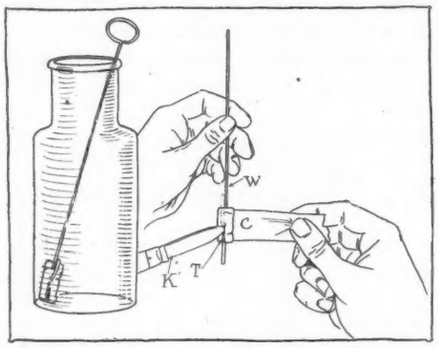


FIG. 2—MAKING AN ACID DAUBER

and tools brought in contact with the work must be free from oil or grease, and cleanliness must be rigidly maintained throughout the entire operation. A clean file, scraper or emery cloth is generally used in preparing the surfaces, after which they should be warmed, and swabbed with prepared acid.

The soldering fluid generally used may be prepared in the following manner: To ¼ pint of muriatic acid, add scraps of zinc till the acid ceases to bubble and a small piece of metal remains. Let this stand for a day, then carefully pour off the clear liquid, or filter it through a cone of blotting paper. Add to this a teaspoonful of sal-ammoniac, and when thoroughly dissolved the solution is ready for use. The soldering iron, or copper bit, which is constructed of copper on account of the qualities of that metal to absorb heat readily and as rapidly give it off again when brought into contact with other metals, should be kept clean and well tinned to facilitate its use in distributing the solder as desired. If allowed to become overheated, crustations will form on the end of the copper bit, which will usually have to be removed with a file before the iron can be used again. A very good addition to a soldering outfit for cleaning irons is a piece of fluorite or fluor spar as it is generally called. This is an excellent flux, and after an iron has been cleaned and heated and then rubbed on the piece of fluor spar the tin or solder will spread itself and adhere beautifully.

Washing Tires

Washing tires and washing a car are two different propositions, says the Michelin tire expert. Water alone should be used to wash tires and as little of it as necessary. After every run the envelope should be wiped clean with a damp sponge or well-wrung cloth.

A common mistake made by motorists is to mix kerosene with water. This may be advisable when washing the body of a car to remove mud and dust from the varnish, but it should never be done when washing tires because kerosene deteriorates rubber. This fact can readily be proved by soaking a piece of rubber in kerosene.

To Make Cylinder Plugs Tight

It sometime happens that the cylinder plugs in the valve chambers of a motor become warped out of shape and as a result a tight joint cannot be obtained. This often gives rise to poor compression and consequent misfiring, which is especially noticeable at low engine speeds. When a plug of this kind does not seat properly, the only suitable remedy is to turn off the seat in a lathe to true it up. To perform this operation a repairshop in Chicago has provided a mandrel such as is shown in Fig. —, into which the plug P of the valve chamber can be screwed; the mandrel A then can be fitted into the revolving spindle of the lathe, and a slight cut readily taken off the seat of the plug. The threaded cup portion of the mandrel A is shallow enough to permit the plug to bottom in it and still leave space enough between it and the seat or shoulder of the plug for the insertion of the cutting tool.

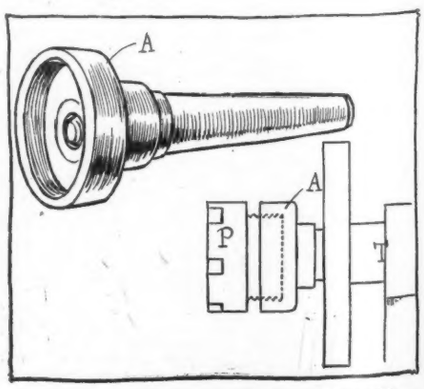


FIG. 3—CYLINDER-PLUG MANDREL